A NEW GENERIC CLASSIFICATION OF TRIBE BIGNONIEAE (BIGNONIACEAE)[1]

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ABSTRACT

The history of classification of the tribe Bignonieae and its genera are reviewed as context for a comprehensive new genus-level classification of the tribe Bignonieae (Bignoniaceae, Lamiales). This new classification is based on a well-supported phylogeny based on multiple molecular markers from both chloroplast and nuclear DNA, a morphological survey, and a broad sampling of taxa. Genera are circumscribed here as clades that are well supported as monophyletic by molecular data and also recognizable by one or more morphological synapomorphies. *Perianthomega* Bureau ex Baill. is here transferred from Bignoniaceae tribe Tecomeae into Bignonieae, and 21 genera and a total of 393 species are recognized in Bignonieae: *Adenocalymma* Mart. ex Meisn. (82 species), *Amphilophium* Kunth (47), *Anemopaegma* Mart. ex Meisn. (45), *Bignonia* L. (28), *Callichlamys* Miq. (1), *Cuspidaria* DC. (19), *Dolichandra* Cham. (8), *Fridericia* Mart. (67), *Lundia* DC. (13), *Manaosella* J. C. Gomes (1), *Mansoa* DC. (12), *Martinella* Baill. (2), *Neojobertia* Baill. (2), *Pachyptera* DC. ex Meisn. (4), *Perianthomega* (1), *Pleonotoma* Miers (17), *Pyrostegia* C. Presl (2), *Stizophyllum* Miers (3), *Tanaecium* Sw. (17), *Tynanthus* Miers (15), and *Xylophragma* Sprague (7). Several genera are here circumscribed differently from previous classifications, in particular *Memora* Miers and *Sampaiella* J. C. Gomes are synonymized with *Adenocalymma*; *Distictella* Kuntze, *Distictis* Mart. ex Meisn., *Glaziova* Bureau, *Pithecoctenium* Mart. ex DC., and *Urbanolophium* Melch. are synonymized with *Amphilophium*; *Cydista* Miers, *Clytostoma* Miers ex Bureau, *Macranthisiphon* Bureau ex K. Schum., *Mussatia* Bureau ex Baill., *Phryganocydia* Mart. ex Bureau, *Potamoganos* Sandwith, *Roentgenia* Urb., and *Saritaea* Dugand are synonymized with *Bignonia*; *Macfadyena* A. DC., *Melloa* Bureau, and *Parabignonia* Bureau ex K. Schum. are synonymized with *Dolichandra*; *Arrabidaea* DC. is synonymized with *Fridericia*; *Gardnerodoxa* Sandwith is synonymized with *Neojobertia*; *Leucocalantha* Barb. Rodr. is synonymized with *Pachyptera*; and *Ceratophytum* Pittier, *Periarrabidaea* A. Samp., *Paragonia* Bureau, *Pseudocatalpa* A. H. Gentry, and *Spathicalyx* J. C. Gomes are synonymized with *Tanaecium*. The genera *Adenocalymma*, *Amphilophium*, *Fridericia*, *Dolichandra*, and *Tanaecium* are formally emended here as to diagnosis and circumscription. A natural key, complete morphological descriptions, and illustrations characterize the accepted genera, and full generic synonymy and a catalogue of their component species summarize their basic nomenclature and geographic range. Three new names are published: *B. neouliginosa* L. G. Lohmann replaces *Phryganocydia uliginosa* Dugand; *B. neoheterophylla* L. G. Lohmann replaces *Cydista heterophylla* Seibert; and *Tanaecium neobrasiliense* L. G. Lohmann replaces *Sanhilaria brasiliensis* Baill. Thirty-two generic names are newly synonymized, and 144 new nomenclatural combinations are made. A lectotype is designated for one genus, *Periarrabidaea* A. Samp., and 78 species names. One species name is neotypified, *Memora campicola* Pilg. (≡ *Adenocalymma campicola* (Pilg.) L. G. Lohmann).

Key words: Neotropical flora, Lamiales, Bignoniaceae, Bignonieae, *Adenocalymma*, *Amphilophium*, *Anemopaegma*, *Arrabidaea*, *Bignonia*, *Dolichandra*, *Fridericia*, *Tanaecium*.

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"Un jour viendra peut-être où quelques groupes naturels cesseront de s'accroître par les recherches même les plus intrépides et les plus persévérantes . . . mais, en attendant ce jour, dont l'aurore est lointaine, les travaux taxonomiques [dans la famille des Bignoniacées] conserveront un caractère provisoire . . ."

—Bureau (1864: 7, Monographie des Bignoniacées)

The tribe Bignonieae Dumort. (Bignoniaceae, Order Lamiales; APG, 2003) includes at least 393 species and is the largest tribe in the Bignoniaceae (Olmstead et al., 2009). The tribe includes both lianas and shrubs, and constitutes the most diverse and abundant clade of lianas in tropical New World lowland forests (Gentry, 1986). The tribe Bignonieae is exclusively American and most of its species are tropical, with a center of diversity in Brazil (Gentry, 1980); only three species are found in warm temperate North America: the native species *Bignonia capreolata* L., and the introduced species *Dolichandra unguis-cati* (L.) L. G. Lohmann (Manning, 2000) and *Amphilophium buccinatorium* (DC.) L. G. Lohmann. The tribe constitutes a well-supported monophyletic lineage within the Bignoniaceae (Spangler & Olmstead, 1999; Olmstead et al., 2009), which is sister to a clade composed of members of the tribes Catalpeae and Oroxyleae plus members of the Tabebuia Alliance and the Paleotropical Clade (Olmstead et al., 2009).

All members of tribe Bignonieae are woody, and most are lianas that climb using tendrils. Some genera also include shrubby species that grow in open dry vegetation such as the Brazilian cerrados and the Paraguayan, Bolivian, and Argentinian savannas. The leaves are opposite and compound, usually 3-foliolate, with the terminal leaflet often replaced by a tendril that is simple to multifid (Sousa-Baena et al., 2013, 2014). Less often, 1-foliolate, 5-foliolate, biternately compound, and biternately pinnate leaves are also found. Although Bignonieae lack stipules, the prophylls of the axillary buds are frequently well developed and stipule-like, and have sometimes been referred to as pseudostipules (e.g., Gentry, 1980). The stems of most species have anomalous secondary growth, with the phloem developing in four to 32 discontinuous wedges as seen in cross-section instead of the usual continuous ring of phloem found in other Bignoniaceae (Santos, 1995). This distinctive secondary growth results from failure of portions of the cambium to produce secondary xylem, which may give higher stem flexibility to the climbers (Atchley, 1976; Caballé, 1993; Pace et al., 2009, 2011). The twigs and young branches are cylindrical, tetragonal, or hexagonal in cross-section, and frequently have glands or extrafloral nectaries (EFNs) in the interpetiolar region. These EFNs are thought to be associated with herbivore defense (Gentry, 1974a; Lohmann, 2004; Nogueira et al., 2012a, 2012b). Mites housed in the domatia found in the axils of the secondary veins on the undersurfaces of the leaflets are also thought to play important roles in herbivore defense (Silva-Gomes, 2009).

The species of this tribe are noted for their showy flowers that are associated with a wide array of animal pollinators: bees, wasps, butterflies, hawkmoths, hummingbirds, and bats (Gentry, 1974a; Lohmann, 2004; Alcantara & Lohmann, 2010, 2011). The flowers are usually borne in terminal or axillary cymes, thyrses, and racemes, or less commonly in fascicles. The calyx is usually cupular, and frequently bears conspicuous glands of various shapes, sizes, densities, and distributions. These glands secrete sugar that attracts ants, which in turn protects the flowers from hummingbirds or xylocopid bees that will puncture the base of the corolla tube just above the calyx to steal nectar without pollinating the flower (Gentry, 1974a). The flowers are variously colored, including white, cream, yellow, orange, pink, purple, red, and blue. The corollas are 5-lobed, gamopetalous, and typically infundibuliform or occasionally tubular in form. The androecium consists of four didynamous stamens plus a small staminode, except in one species of *Tanaecium* Sw., *T. caudiculatum* (Standl.) L. G. Lohmann, which has two stamens and no staminodes. The gynoecium is composed of a bilocular superior ovary with axile placentation, an elongated style, and a bilamellate stigma. The ovary is typically surrounded by a conspicuous nectariferous disk, which offers rewards for pollinators (Gentry, 1978); occasionally the nectary is absent and mimetic pollination strategies are hypothesized (Heinrich & Raven, 1972; Umaña et al., 2011). The ovules are numerous, and are borne in one or more series on each placenta. The fruits are septicidal capsules of varied shape, size, and texture, and usually split at maturity into two valves. The seeds have a reduced endosperm and are typically winged and wind-dispersed, or sometimes corky and water-dispersed (Gentry, 1983b; Fischer et al., 2004; Lohmann, 2006).

Classification and postulation of species relationships in the past have been based on morphology, which is widely variable in this group and thus has supported a large number of different generic circumscriptions. Molecular data now provide additional evidence to discern relationships among the

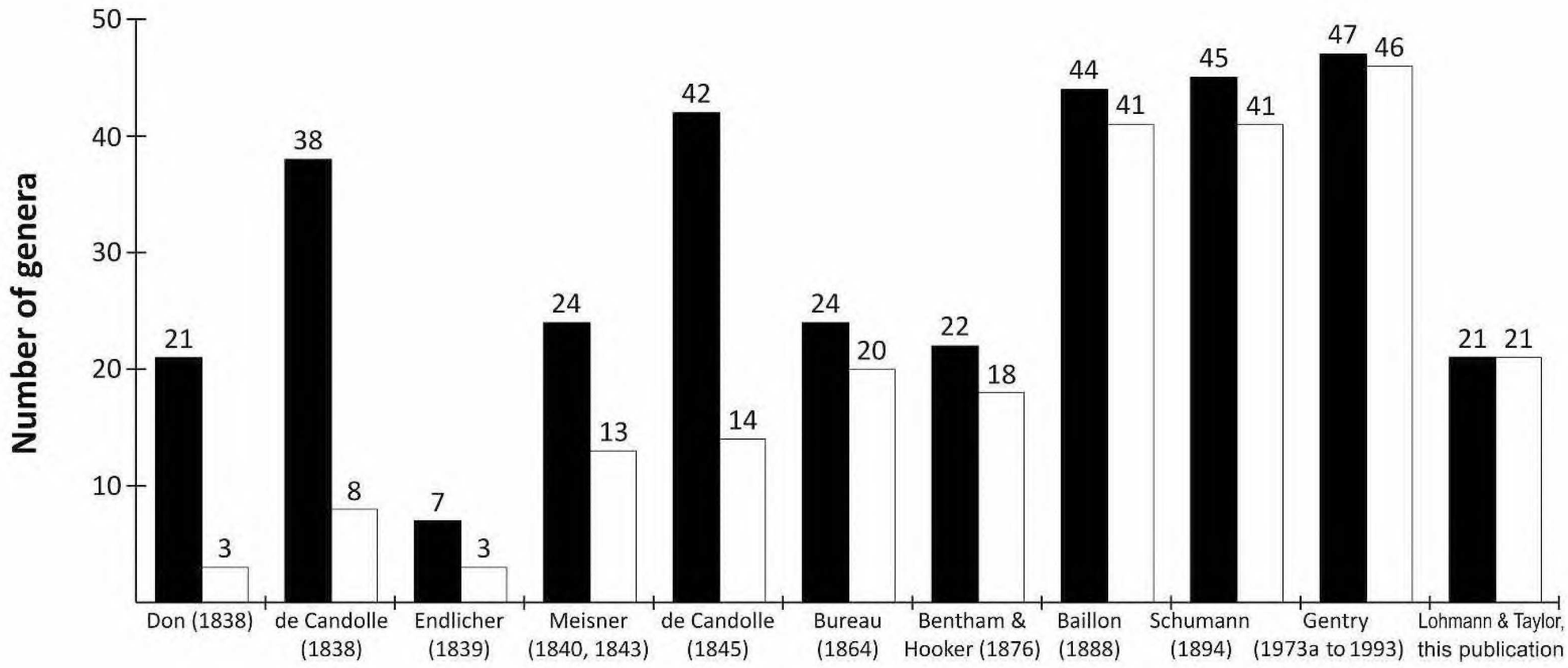


Figure 1. Number of Bignonieae genera in the different classification systems. Black bars indicate the total number of genera included under Bignonieae by that author; white bars indicate the total number of those genera that are still included in the tribe as either accepted names or synonyms.

taxa of this group (Lohmann, 2006), allowing for the identification of genus-level monophyletic groupings that are supported by key morphological characters. Here this new information is integrated with taxonomic studies of the species of this tribe to compile a new generic classification of the Bignonieae, a morphological characterization of these genera, and a list of the currently accepted species in the tribe. This present work relies significantly on the study materials and previous works, published and unpublished, of A. H. Gentry† (1945–1993).

Taxonomic History of Bignonieae

Bignonia L. was the first genus named in this family (Linnaeus, 1753). Jacquin (1963) subsequently treated the genus for the Caribbean region, while Aublet (1775) treated it for French Guiana. Later Jussieu (1789) described the ordo (equivalent there to family; McNeill et al., 2006, Art. 18.2) Bignones, which he divided into three numbered groups on the basis of habit and fruit dehiscence. Several subsequent authors described new species, new genera, and new morphology (Vahl, 1798; Willdenow, 1800 [1801]; Brown, 1810; Kunth, 1818, 1819; Vellozo, 1825 [1829]; Chamisso, 1832), but none of these treatments presented revised classifications between the family and genus level. Gentry (1980) and Spangler and Olmstead (1999) reviewed the classification of the family Bignoniaceae. The history of the classification of the tribe Bignonieae is outlined below, and the principal classifications are summarized in Table 1 and Figure 1.

The tribe Bignonieae was first recognized by Dumortier (1829: 23), as "Trib. 3. Bignoniaceae" in the family Rhinanthaceae. Dumortier clearly labeled his Rhinanthaceae a family and the group he there called Bignoniaceae a tribe, therefore the rank of his name is clear and its spelling must be corrected to Bignonieae (McNeill et al., 2006, Art. 19.6). Dumortier included in this tribe the same genera as Jussieu's family Bignoniaceae, but Jussieu's and Dumortier's names were published at different ranks and thus are distinct nomenclaturally. Dumortier's tribe Bignonieae is today classified in a different family—Bignoniaceae instead of Rhinanthaceae—and has a different circumscription, but these changes do not affect its valid publication. More specifically, Dumortier included in the tribe all genera with what he called an indistinct placentation type, with the seeds attached to the external borders of the placenta: *Bignonia*, *Tecoma* Juss., *Spathodea* P. Beauv., *Catalpa* Scop., *Chilopsis* D. Don, *Millingtonia* L. f., *Jacaranda* Juss., *Amphilophium* Kunth., *Eccremocarpus* Ruiz & Pav., and *Fieldia* A. Cunn. These genera are a heterogeneous assemblage today variously included in the family Gesneriaceae (*Fieldia*) and in the Bignoniaceae tribes Jacarandeae, Tourretieae, Tecomeae, Oroxyleae, and Bignonieae and also the Paleotropical Clade of Olmstead et al. (2009).

Bojer (1837) next studied the tribe Bignonieae, and placed in it all Bignoniaceae with a bilocular silique fruit and winged seeds. Bojer's treatment was restricted to the island of Mauritius, and he included here only *Bignonia*, *Catalpa*, and *Spathodea*, which are all currently included in the family Bignoniaceae but variously classified in the tribes Bignonieae and Catalpeae and the Paleotropical Clade of Olmstead et al. (2009), respectively. Bojer first used the degree of calyx lobing as a generic character, and this has

Table 1. Comprehensive treatments of Bignonieae. Genera marked with a ✔ were included in Bignonieae as either accepted names or synonyms. See text for detailed discussion and nomenclature.

Don (1838)	de Candolle (1838)	Endlicher (1839)	Meisner (1840, 1843)
Tribe Bignonieae	Tribe Bignonieae	Tribe Eubignonieae	Tribe Eubignoniées
I.	Subtribe I. Eubignonieae	(= Tribe Bignonieae)	(= Tribe Bignonieae)
✔*Amphilophium*	(= Subtribe Bignoninae)	✔*Amphilophium*	Division Monostictides
Asianthus	✔*Amphilophium*	*Asianthus*	✔*Arrabidaea*
✔*Bignonia*	*Argylia*	✔*Bignonia*	(= *Fridericia*)
Chilopsis	✔*Arrabidaea*	*Calosanthes*	*Asianthus*
Delostoma	(= *Fridericia*)	*Delostoma*	✔*Bignonia*
Ferdinandusa	*Asianthus*	✔*Haplolophium*	*Calosanthes*
✔*Fridericia*	✔*Bignonia*	(= *Amphilophium*)	✔*Cuspidaria*
Jacaranda	*Calosanthes*	*Millingtonia*	*Ferdinandusa*
Oxera	✔*Cuspidaria*		✔*Haplolophium*
Spathodea	*Delostoma*		(= *Amphilophium*)
Stenolobium	✔*Haplolophium*		✔*Lundia*
Tecoma	(= *Amphilophium*)		✔*Mansoa*
Zeyheria	✔*Lundia*		*Millingtonia*
II.	✔*Mansoa*		*Oxera*
Calosanthes	*Millingtonia*		*Pachyptera*
Platycarpum	*Stereospermum*		*Peltospermum*
III.	Subtribe II. Catalpeae		*Psilogyne*
Argylia	(= Subtribe Catalpinae)		*Schrebera*
Incarvillea	*Catalpa*		*Sickingia*
Millingtonia	*Chilopsis*		*Wightia*
Wightia	*Eccremocarpus*		Division Pleiostictides
IV.	✔*Fridericia*		✔*Adenocalymma*
Catalpa	*Heterophragma*		✔*Amphilophium*
Schrebera	*Jacaranda*		✔*Anemopaegma*
	Neowedia		*Cybistax*
	Pajanelia		*Delostoma*
	Pawllonia		✔*Distictis*
	Spathodea		(= *Amphilophium*)
	Tabebuia		✔*Pithecoctenium*
	Tecoma		(= *Amphilophium*)
	Tourrettia		
	Zeyheria		
	Subtribe III. Gelsemieae		
	(= Subtribe Gelseminae)		
	Bravasia		
	Esterhazya		
	Gelsemium		
	Holoregmia		
	Peltospermum		
	Platycarpum		
	Psilogyne		
	Rhigozum		
	Schrebera		
	Trigonocarpus		
	Wightia		

de Candolle (1845)	Bureau (1864)	Bentham (1876)	Baillon (1888)
Tribe Bignonieae	Groupe I.	Tribe Bignonieae	Série des Bignones
Subtribe Eubignonieae	(= Tribe Bignonieae)	Division Monostictides	(= Tribe Bignonieae)
(= Subtribe Bignoninae)	✔*Adenocalymma*	✔*Adenocalymma*	✔*Adenocalymma*
Division Monostictides	✔*Amphilophium*	✔*Anemopaegma*	✔*Amphilophium*
✔*Anemopaegma*	✔*Anemopaegma*	✔*Arrabidaea*	✔*Anemopaegma*
✔*Arrabidaea*	✔*Anisostichus*	(= *Fridericia*)	✔*Arrabidaea*
(= *Fridericia*)	(= *Bignonia*)	✔*Bignonia*	(= *Fridericia*)
Asianthus	✔*Arrabidaea*	✔*Cuspidaria*	✔*Bignonia*

Table 1. Continued.

de Candolle (1845)	Bureau (1864)	Bentham (1876)	Baillon (1888)
✔*Bignonia*	(= *Fridericia*)	✔*Fridericia*	✔*Callichlamys*
Calosanthes	✔*Bignonia*	✔*Lundia*	✔*Clytostoma*
✔*Cuspidaria*	*Calosanthes*	✔*Macfadyena*	(= *Bignonia*)
✔*Distictis*	✔*Callichlamys*	(= *Dolichandra*)	✔*Cremastus*
(= *Amphilophium*)	✔*Cuspidaria*	✔*Melloa*	(= *Cuspidaria*)
✔*Fridericia*	✔*Distictis*	(= *Dolichandra*)	✔*Cuspidaria*
✔*Haplolophium*	(= *Amphilophium*)	✔*Saldanhaea*	✔*Cydista* (= *Bignonia*)
(= *Amphilophium*)	✔*Fridericia*	(= *Cuspidaria*)	✔*Distictis*
✔*Lundia*	✔*Haplolophium*	✔*Tynanthus*	(= *Amphilophium*)
✔*Macfadyena*	(= *Amphilophium*)	Division Pleostictides	✔*Doxantha*
(= *Dolichandra*)	*Leguminaria*	✔*Amphilophium*	(= *Dolichandra*)
✔*Mansoa*	✔*Lundia*	✔*Callichlamys*	✔*Fridericia*
Millingtonia	✔*Macfadyena*	✔*Distictis*	✔*Glaziovia*
✔*Pachyptera*	(= *Dolichandra*)	(= *Amphilophium*)	(= *Amphilophium*)
Division Pleostictides	✔*Macrodiscus*	✔*Glaziovia*	✔*Haplolophium*
✔*Adenocalymma*	(= *Amphilophium*)	(= *Amphilophium*)	(= *Amphilophium*)
✔*Amphilophium*	✔*Mansoa*	✔*Haplolophium*	✔*Levya* (= *Bignonia*)
Cybistax	*Microdiscus*	(= *Amphilophium*)	✔*Lundia*
Delostoma	*Millingtonia*	*Haussmannia*	✔*Macfadyena*
✔*Pithecoctenium*	✔*Pachyptera*	*Millingtonia*	(= *Dolichandra*)
(= *Amphilophium*)	✔*Pithecoctenium*	*Nyctocalos*	✔*Macrodiscus*
Subtribe Catalpeae	(= *Amphilophium*)	*Oroxylum*	(= *Amphilophium*)
(= Subtribe Catalpinae)	✔*Pyrostegia*	✔*Pithecoctenium*	✔*Mansoa*
Division Monostictdes	✔*Schizopsis*	(= *Amphilophium*)	✔*Martinella*
Argylia	(= *Tynanthus*)	✔*Tanaecium*	✔*Melloa* (= *Dolichandra*)
Catalpa	✔*Tanaecium*		✔*Memora*
Catophractes			(= *Adenocalymma*)
Chilopsis			*Millingtonia*
Craterotecoma			✔*Mussatia* (= *Bignonia*)
Heterophragma			✔*Neojobertia*
Jacaranda			✔*Neomacfadyena*
Pajanella			(= *Fridericia*)
Platycarpum			*Nyctocalos*
Rhigozum			*Oroxylum*
Spathodea			✔*Paragonia*
Stereospermum			(= *Tanaecium*)
Tabebuia			✔*Paramansoa*
Tecoma			(= *Fridericia*)
Tourrettia			✔*Perianthomega*
Zeyheria			✔*Petastoma* (= *Cuspidaria*)
Division Pleiostictides			✔*Phaedranthus*
Sparattosperma			(= *Amphilophium*)
Subtribe Incarvilleae			✔*Phryganocydia* (= *Bignonia*)
(= Subtribe Incarvillinae)			✔*Pithecoctenium*
Amphicone			(= *Amphilophium*)
Incarvillea			✔*Pleonotoma*
Subtribe Eccremocarpeae			✔*Pyrostegia*
(= Subtribe Eccremocarpinae)			✔*Saldanhaea*
Bravaisia			(= *Cuspidaria*)
Dipterosperma			✔*Sanhilaria*
Eccremocarpus			(= *Tanaecium*)
Pteropodium			✔*Setilobus*
			(= *Cuspidaria*)
			✔*Stizophyllum*
			✔*Tanaecium*
			✔*Tynanthus*

Table 1. Continued.

Schumann (1894)	Gentry (1973a to 1993, unpubl.)	Lohmann & Taylor, this publication
Tribe Bignonieae	Tribe Bignonieae	Tribe Bignonieae
✔*Adenocalymma*	✔Adenocalymma	✔*Adenocalymma*
✔*Amphilophium*	✔*Amphilophium*	✔*Amphilophium*
✔*Anemopaegma*	✔*Anemopaegma*	✔*Anemopaegma*
✔*Arrabidaea*	✔*Arrabidaea*	✔*Bignonia*
(= *Fridericia*)	(= *Fridericia*)	✔*Callichlamys*
✔*Bignonia*	✔*Bignonia*	✔*Cuspidaria*
✔*Callichlamys*	✔*Callichlamys*	✔*Dolichandra*
✔*Clytostoma* (= *Bignonia*)	✔*Ceratophytum*	✔*Fridericia*
✔*Cremastus* (= *Cuspidaria*)	(= *Tanaecium*)	✔*Lundia*
✔*Cuspidaria*	✔*Clytostoma* (= *Bignonia*)	✔*Manaosella*
✔*Cydista* (= *Bignonia*)	✔*Cuspidaria*	✔*Mansoa*
✔*Distictis*	✔*Cydista* (= *Bignonia*)	✔*Martinella*
(= *Amphilophium*)	✔*Distictella*	✔*Neojobertia*
✔*Doxantha*	(= *Amphilophium*)	✔*Tanaecium*
✔*Fridericia*	✔*Distictis*	✔*Pachyptera*
✔*Glaziovia*	(= *Amphilophium*)	✔*Perianthomega*
(= *Amphilophium*)	✔*Dolichandra*	✔*Pleonotoma*
✔*Haplolophium*	✔*Fridericia*	✔*Pyrostegia*
(= *Amphilophium*)	✔*Gardnerodoxa*	✔*Stizophyllum*
Haussmannia	(= *Neojobertia*)	✔*Tynanthus*
✔*Levya* (= *Bignonia*)	✔*Glaziovia*	✔*Xylophragma*
✔*Lundia*	(= *Amphilophium*)	
✔*Macfadyena*	✔*Haplolophium*	
(= *Dolichandra*)	(= *Amphilophium*)	
✔*Macranthisiphon*	✔*Leucocalantha*	
(= *Bignonia*)	(= *Pachyptera*)	
✔*Macrodiscus*	✔*Lundia*	
(= *Amphilophium*)	✔*Macfadyena*	
✔*Mansoa*	(= *Dolichandra*)	
✔*Martinella*	✔*Macranthisiphon*	
✔*Melloa*	(= *Bignonia*)	
(= *Dolichandra*)	✔*Manaosella*	
✔*Memora*	✔*Mansoa*	
(= *Adenocalymna*)	✔*Martinella*	
Millingtonia	✔*Melloa* (= *Dolichandra*)	
✔*Mussatia* (= *Bignonia*)	✔*Memora*	
✔*Neojobertia*	(= *Adenocalymna*)	
✔*Neomacfadyena*	✔*Mussatia* (= *Bignonia*)	
(= *Fridericia*)	✔*Neojobertia*	
Nyctocalos	✔*Parabignonia*	
Oroxylum	(= *Dolichandra*)	
✔*Paragonia*	✔*Paragonia*	
(= *Tanaecium*)	(= *Tanaecium*)	
✔*Paramansoa*	✔*Periarrabidaea*	
(= *Fridericia*)	(= *Tanaecium*)	
✔*Perianthomega*	✔*Phryganocydia*	
✔*Phaedranthus*	(= *Bignonia*)	
(= *Amphilophium*)	✔*Piriadacus*	
✔*Phryganocydia*	(= *Fridericia*)	
(= *Bignonia*)	✔*Pithecoctenium*	
✔*Pithecoctenium*	(= *Amphilophium*)	
(= *Amphilophium*)	✔*Pleonotoma*	
✔*Pleonotoma*	✔*Potamoganos*	
✔*Pyrostegia*	(= *Bignonia*)	
✔*Saldanhaea*	✔*Pseudocatalpa*	
(= *Cuspidaria*)	(= *Tanaecium*)	

Table 1. Continued.

Schumann (1894)	Gentry (1973a to 1993, unpubl.)
✔*Sanhilaria* (= *Tanaecium*)	✔*Pyrostegia*
✔*Setilobus* (= *Tynanthus*)	✔*Roentgenia* (= *Bignonia*)
✔*Stizophyllum*	✔*Saritaea* (= *Bignonia*)
✔*Tanaecium*	✔*Spathicalyx* (= *Tanaecium*)
✔*Tynanthus*	✔*Stizophyllum*
✔*Xylophragma*	✔*Tanaecium*
	✔*Tynanthus*
	✔*Xylophragma*

proven to be a useful indicator of some generic relationships in Bignonieae.

The first comprehensive treatment of the tribe Bignonieae was by Don (1838). His circumscription of this tribe, like that of Bojer, was broad and included all the members of the family Bignoniaceae with a 2-valved capsule and winged seeds. However, these are common characters in the family, which led to the recognition of a systematically heterogeneous Bignonieae. Only three of the genera that Don included in his tribe Bignonieae (*Bignonia*, *Amphilophium*, and *Fridericia* Mart.) are retained in this tribe today; his other 18 genera are now variously classified in other Bignoniaceae tribes, the Lamiaceae (*Oxera* Labill.), the Scrophulariaceae (*Wightia* Wall.), and the Rubiaceae (*Ferdinandusa* Pohl). Don added corolla, stamen, and fruit characters to his generic diagnoses, and separated the genera of the tribe Bignonieae into numbered but unranked groups based on number of fertile stamens and staminodes.

Augustin Pyramus de Candolle (1838) presented a comprehensive synoptic treatment of the family Bignoniaceae, with 336 species and 38 genera included in the tribe Bignonieae and the remaining members of this family placed in the tribe Crescentieae. He followed previous authors in including in the tribe Bignonieae all the members of this family with dehiscent fruits and winged seeds. Here he recognized three subtribes, Eubignoniées (i.e., Bignoniinae), Catalpées (i.e., Catalpinae), and Gelsemiées (i.e., Gelsemiinae), plus a group of nine monotypic genera separated as genera non satis nota seu anomala (i.e., incompletely known or unusual genera). De Candolle was the first to give importance to capsule dehiscence, whether loculicidal, septicidal, or indehiscent, which he used to characterize his subtribes. Molecular phylogenetic data have indicated that capsule dehiscence types represent morphological synapomorphies of clades and are indeed informative characters for delimiting tribes within the family Bignoniaceae (Spangler & Olmstead, 1999; Olmstead et al., 2009). De Candolle's subtribe Bignoniinae included seven genera that are today included in tribe Bignonieae, and six genera that are now included in tribe Tecomeae or in the Paleotropical Clade of Olmstead et al. (2009). *Fridericia*, now classified in tribe Bignonieae, was separated in de Candolle's subtribe Catalpinae, which also included members of several other modern Bignoniaceae tribes as well as of the families Acanthaceae and Paulowniaceae. De Candolle's subtribe Gelsemiinae and the genera non satis nota seu anomala did not include any members of tribe Bignonieae as currently circumscribed.

Endlicher's (1839) treatment of the family was restricted to the generic level and did not closely follow previous taxonomies. He divided the family Bignoniaceae into five subordos (equivalent to subfamilies; McNeill et al., 2006, Art. 19.2): Sesameae (i.e., Sesamoideae; two genera), Eccremocarpeae (i.e., Eccremocarpoideae; three genera, including *Fridericia*), Incarvilleae (i.e., Incarvilleoideae; two genera), Tourretieae (i.e., Tourretioideae; one genus), and Bignonieae (i.e., Bignonioideae; 14 genera). He characterized the subfamily Bignonioideae in the same way that previous authors characterized the tribe Bignonieae, by a bilocular septicidal capsule and usually winged seeds, together with a new character, hypogeal seedling elongation, which was also found in his subfamily Eccremocarpoideae. Endlicher recognized three tribes within his Bignonioideae, Tribe 1. Argylieae, Tribe 2. Tecomeae, and Tribe 3. Eubignonieae (i.e., Bignonieae). His tribe Bignonieae corresponded to de Candolle's (1838) subtribe Bignoniinae and was similarly characterized by a septicidal capsule and winged seeds. It included seven genera, only three of which are currently included in Bignonieae (*Amphilophium*, *Bignonia*, and *Haplolophium* Cham.). Endlicher's tribe Tecomeae was generally equivalent to de Candolle's subtribe Catalpinae, both of which were characterized by septicidal capsules and winged

seeds and did not include any genera of today's tribe Bignonieae. Endlicher's Argylieae was monogeneric, had no equivalent in de Candolle's classification, and did not include any genus of today's Bignonieae; it was characterized by a septicidal capsule and unwinged seeds.

Meisner (1840, 1843; sometimes also spelled Meissner, Stafleu & Cowan, 1981) recognized two subordos (equivalent to subfamilies) of Bignoniaceae, Bignonieae (i.e., Bignonioideae) and Crescentineae (i.e., Crescentioideae). He followed Endlicher (1839) in recognizing the subfamily Bignonioideae, and de Candolle (1838) in dividing this into the tribes Eubignoniées (i.e., Bignonieae), Catalpées (i.e., Catalpeae), and Gelsemiées (i.e., Gelsemieae). A novelty of Meisner's system was the division of tribes Bignonieae and Catalpeae into two further groups each, similarly named in each tribe. These were called Monostictides and Pleiostictides, and were equivalent to subtribes (however, because a name can only be used once, some of these subtribe names are illegitimate). These were characterized by the number of seed series on each placenta, one versus more than one, respectively. Meisner's circumscription of Bignonieae was much broader than that of today, and included various members of tribe Bignonieae, other Bignoniaceae tribes and subtribes, Rubiaceae (*Ferdinandusa* Pohl), Apocynaceae (*Peltospermum* DC., now included in *Aspidosperma* Mart. & Zucc.), and Lamiaceae (*Psilogyne* DC., now included in *Vitex* L.). Meisner followed Endlicher in excluding *Fridericia*, today included in the tribe Bignonieae, from this tribe based on fruit morphology. Under Meisner's system, *Fridericia* was included in tribe Catalpeae, subtribe Monostictides.

Augustin Pyramus de Candolle prepared the next treatment of the family Bignoniaceae, based on the earlier family monograph (de Candolle, 1838) but now expanded into the sole work ever to treat all known genera and species of the family with full descriptions (de Candolle, 1845). This monograph was edited and modified before publication by his son, Alphonse de Candolle, who clearly indicated his own additions or changes from his father's version. Here the two basic subdivisions of the family were maintained, with 492 species in the broadly circumscribed tribe Bignonieae, 173 of which were still classified in the highly heterogeneous *Bignonia*. However, in this new classification the infratribal divisions were changed. The subtribes Bignoniinae and Catalpinae were retained, but the Gelsemiinae was no longer recognized, while Endlicher's (1839) subfamilies Incarvilleoideae and Eccremocarpoideae were here treated as subtribes Incarvilleae (i.e., Incarvilleinae) and Eccremocarpeae (i.e., Eccremocarpinae). Capsule dehiscence was still important for distinguishing the subtribes. The Catalpinae, Incarvilleinae, and Eccremocarpinae were all characterized by loculicidal capsules, and included a heterogenerous group of taxa that are today included variously in the Bignoniaceae tribes Tecomeae, Catalpeae, and Tourretieae and the Tabebuia Alliance and the Paleotropical Clade of Olmstead et al. (2009), in Rubiaceae (*Platycarpum* Bonpl.), and in Acanthaceae (*Bravaisia* DC.). His subtribe Bignoniinae, on the other hand, was characterized by a septicidal capsule and is similar to the tribe Bignonieae as currently cirumscribed. This classification also followed Meisner (1840, 1843) in dividing Bignoniinae and Catalpinae each into groups called Monostictides and Pleiostictides, but differed from Meisner in transferring *Anemopaegma* Mart. ex Meisn. and *Distictis* Mart. ex Meisn. from Pleiostictides to Monostictides. This treatment also adopted a significantly narrower circumscription of *Bignonia*, with 191 species here excluded from this genus and placed variously in *Cuspidaria* DC., *Fridericia* Mart., *Lundia* DC., *Mansoa* DC., *Heterophragma* DC., *Peltospermum* DC., and *Boutonia* DC. However, tribe Bignonieae remained highly heterogeneous in this classification, with only 14 of de Candolle's 42 genera still included today in this tribe.

Bureau (1864: 23) considered the higher-level classification of de Candolle (1845) "more simple and more natural" than that of Endlicher because of its fewer major groupings. However, Bureau did not accept this classification, but instead divided the family into 15 major groups that are equivalent to today's tribes but were numbered rather than named. For each group Bureau chose a type or exemplar genus that he used to characterize the group as a whole. The type genus was chosen to have the highest number of characters in common with other members of the group and provide the best generalization of the group. Bureau's Group I, exemplified by *Arrabidaea* and characterized by a septicidal capsule, corresponds to today's Bignonieae. Bureau's circumscription of Bignonieae was much narrower than previously, and much more similar to today's circumscription with 20 of his 24 genera still classified in this tribe. Only one genus of today's Bignonieae, *Dolichandra* Cham., was excluded from Bureau's Group I and included in his Group II instead. Bureau's system was also novel in its use of combinations of characters to diagnose the groups, in particular septum position, number of fertile stamens, and number of ovary locules. Bureau had a relatively

narrow generic concept and split several of the existing genera.

Bentham's (1876) treatment of the Bignoniaceae did not closely follow previous classifications. The family was divided into four tribes: Bignonieae, Tecomeae, Jacarandeae, and Crescentieae. Similarly to Bureau, he included in the tribe Bignonieae all the genera with septicidal capsules; of the 21 genera classified here, 15 were shared with Bureau's classification. Unlike Bureau but similarly to Meisner (1840, 1843) and de Candolle (1845), Bentham divided the tribe Bignonieae into the subgroups Monostictides and Pleiostictides. However, *Adenocalymma* was transferred into Monostictides, and *Haplolophium* into Pleiostictides. In addition, Bentham followed de Candolle in placing *Anemopaegma* under Monostictides, but followed Meisner (1840, 1843) in placing *Distictis* back into Pleiostictides. Bentham recognized much more broadly circumscribed genera than did Bureau and again included several species of *Arrabidaea* and a number of small genera (*Anisostichus* Miers, *Cremastus* Miers, *Cydista* Bureau, *Doxantha* Miers, *Panterpa* Miers, *Paragonia* Bureau, *Petastoma* Miers, *Phaedranthus* Miers, *Pleonotoma* Miers, *Pyrostegia* C. Presl, and *Stizophyllum* Miers) in *Bignonia*. He also synonymized some other genera, in particular *Craterotecoma* Mart. ex Meisn. with *Lundia*, *Dolichandra* with *Macfadyena* A. DC. and *Pachyptera* and *Memora* with *Adenocalymma*. This reduction in the number of genera perhaps reflected Bentham's concerns about memory and the number of genera that should be recognized (Stevens, 1997a, 1997b). His view in this was rejected by subsequent authors.

Baillon (1888) next presented a classification for this family, which differed from previous ones in recognizing a série des Bignones (i.e., tribe Bignonieae) without any subdivisions. He also rejected Bentham's (1876) broad genus circumscriptions, recognizing 13 genera that had been placed in synonymy and describing several new genera, notably *Martinella* Baill., *Neojobertia* Baill., *Neomacfadya* Baill., *Paramansoa* Baill., *Sanhilaria* Baill., and *Setilobus* Baill. In total, Baillon here recognized 44 genera in the tribe Bignonieae, of which 41 are still included in the tribe (as either accepted names or synonyms). However, he again placed *Dolichandra* in a different tribe, following Bureau (1864). Baillon cited exemplar species or sometimes listed component species for his new genera, but did not explicitly associate the new genus name with these species epithets. Therefore he did not publish valid new combinations for the species in his new genera (McNeill et al., 2006, Art. 33.1).

Schumann's (1894) treatment of the family Bignoniaceae for the *Natürlichen Pflanzenfamilien* presented the most recent comprehensive treatment until now for the tribe Bignonieae at the generic level, but he mostly did not detail the species. Schumann closely followed Baillon's (1888) tribal circumscriptions for this family, recognizing Bignonieae, Tecomeae, Eccremocarpeae, and Crescentieae, but included one additional tribe, the Tourretieae. He also followed Baillon's narrow generic delimitations. Schumann recognized 43 of the 44 genera recognized in the tribe Bignonieae by Baillon, synonymizing only *Petastoma*, and added two genera to it, *Macranthisiphon* Bureau ex K. Schum. and *Haussmannia* F. Muell. (= *Neosepicaea* Diels, currently classified in the tribe Oroxyleae). Also similarly to Baillon, no subdivisions were recognized within the tribe.

Contemporaneously with this family synopsis (Schumann, 1894) the two main specialists in this family collaborated to produce a complete floristic treatment of the Bignoniaceae for the *Flora Brasiliensis* (Bureau & Schumann, 1896). These two works followed the same family classification and generic circumscriptions. Schumann's (1894) family synopsis extensively referenced and included information from this flora, and in some cases validated new names used in the flora. The family synopsis is written in a way that suggests it may have originally been expected to be published after the flora (the nomenclatural aspects of this situation are discussed in more detail in the Taxonomic Treatment section below). Bureau and Schumann provided detailed descriptions of all 36 genera and 260 species of the tribe Bignonieae occurring in Brazil, and because Brazil is the center of diversity of Bignonieae their treatment remains a major reference for this group.

Since Bureau and Schumann's time several botanists have studied individual genera and/or produced comprehensive floras that have contributed significantly to understanding the tribe Bignonieae, but no work has addressed the tribe as a whole. By the 1900s, a narrow generic concept predominated among students of the Bignoniaceae and generic splitting became common. For example, Urban (1916) described *Pseudopaegma* Urb., *Roentgenia* Urb., and *Nestoria* Urb.; Melchior (1927) described *Urbanolophium* Melch.; Sampaio and Kuhlmann (1934) described *Pseudocalymma* A. Samp. & Kuhlm.; Dugand (1945) described *Saritaea* Dugand; Pichon (1946) described 11 new genera; and Gomes (1949, 1956) described *Sampaiella* J. C. Gomes, *Spathicalyx* J. C. Gomes, and *Kuhlmannia* J. C. Gomes. None of these new genera included more than two species, none was easily separable morphologi-

cally, and none is recognized in the present classification.

Sandwith published approximately 20 works between 1937 and 1974 that significantly influenced the systematics of Bignoniaceae and particularly of the tribe Bignonieae (see Brenan, 1966, for a review of Sandwith's publications), but he did not present a comprehensive treatment of the tribe. His works presented descriptions of individual new species, floristic inventories, nomenclatural adjustments, and some changes of generic circumscription. He described the new genus *Potamoganos* Sandwith (1937) and again recognized several other genera that had been synonymized (e.g., *Sideropogon* Pichon, *Saritaea*, and *Roentgenia*), but he also synonymized *Onohualcoa* Lundell with *Mansoa*, *Pseudopaegma* with *Anemopaegma*, *Sanhilaria* with *Paragonia*, and *Nestoria* and *Kuhlmannia* with *Pleonotoma*. Notably Sandwith significantly expanded the circumscription of *Arrabidaea* to include the previously recognized genera *Petastoma*, *Panterpa*, *Cremastus*, *Paramansoa*, *Scobinaria* Siebert, *Paracarpaea* (K. Schum.) Pichon, *Tetrastichella* Pichon, and *Sampaiella*.

Alwyn H. Gentry was the most recent major student of the family Bignoniaceae. He recognized eight tribes in this family, of which Bignonieae was the largest. The early heterogeneous circumscription of the tribe had been much improved by Bureau (1864), but it remained diagnosed by a single character, fruit septum position, until Gentry (1980) incorporated characters of habit, wood anatomy, and tendrils. This clarified its circumscription and allowed classification of a number of previously controversial taxa. Of the genera that were found in this present analysis to belong to the tribe Bignonieae, Gentry (1990, 1992c) excluded only *Perianthomega* Bureau ex Baill. By the time Gentry started his work, generic splitting had reached the point that the tribe Bignonieae had the lowest ratio of species to genera of any sizeable group of angiosperms (Gentry, 1973a). Gentry's circumscription of genera was based on newly studied morphological, anatomical, pollen and field data, representing a significant advance for the taxonomy of the family. He used a broader generic concept than that of recent authors, and decreased significantly the number of genera in the tribe by merging genera that were separated by characters he considered unreliable. Those unreliable characters included inflorescence branching pattern, degree of seed thickening, seed wing length, and seed pubescence (Gentry, 1973a, 1976, 1979). Gentry's contributions to knowledge of the tribe Bignonieae also extended to a much improved understanding of the distribution, floristics, and ecology of the species and genera (see Miller et al., 1996, for a review of Gentry's publications).

It is very unfortunate that Gentry was unable to produce a comprehensive classification and revision of the tribe before his untimely death. His work was well advanced by then, however, and his view of the classification of this tribe is inferred from his publications (in particular Gentry, 1973a, 1975, 1976, 1979, 1985, 1992b, 1992c, 1993) and referred to here as Gentry's system. In this classification 47 genera were recognized in the tribe Bignonieae (Table 1), of which 30 genera had three or fewer species, while *Adenocalymma*, *Anemopaegma*, *Arrabidaea*, and *Memora* Miers together had 250 species and comprised the majority of the species then recognized in the tribe. Gentry (1973a) himself noted that some of these genera were highly polymorphic and included such a wide range of morphological variation that their species sometimes lacked the supposed diagnostic features of the genus. Although Gentry did not present a full taxonomic treatment of the tribe Bignonieae, his Neotropical floristic treatments cover a wide geographic range and provide an essential detailing of the majority of Bignonieae taxa that forms the basis of the species-level classification here (Gentry, 1973b, 1977, 1982, 1983a, 1997). Additional taxonomic studies prepared with access to his unfinished works and specimen annotations present significant additional data for the tribe Bignonieae (Hauk, 1997, 1999, 2002; Pool, 2007a, 2007b, 2008, 2009).

A New Classification of Tribe Bignonieae

Here, a new, phylogenetically based classification is adopted, with the hypotheses of phylogenetic relationships explicitly formulated, the relationships among the taxa detailed, and the basis for the circumscriptions of genera spelled out. The classification of the tribe Bignonieae here differs from previous treatments in several ways, in particular the inclusion here of *Perianthomega* (in this following Baillon, 1888, and Schumann, 1894), the recognition of 21 rather than 47 genera, the synonymization of several well-known genera, and the separation here of the species formerly placed in the polyphyletic genus *Arrabidaea* (Lohmann, 2006) variously in *Fridericia*, *Cuspidaria*, and *Tanaecium*.

Not surprisingly, several of the genera recognized here based on molecular data have been previously accepted. For example, Bentham (1876) placed *Adenocalymma* and *Memora* in synonymy more than 100 years ago, and Gentry (1973a) separated them but agreed that they were closely related and may be considered a single genus. The affinities between

Phryganocydia Mart. ex Bureau, *Cydista*, *Clytostoma* Miers ex Bureau, *Roentgenia*, *Potamoganos*, and *Mussatia* Bureau ex Baill. were also noted before (Gentry, 1973a; Hauk, 1997, 2002); these are all here included in *Bignonia*. The subtribe Pithecocteniinae of Melchior (1927) included *Amphilophium*, *Distictella* Kuntze, *Haplolophium*, and *Pithecoctenium* Mart. ex Meisn., and together with *Distictis* and *Glaziova* these genera are here included within *Amphilophium*. The affinities among *Dolichandra*, *Macfadyena*, *Melloa*, and *Parabignonia* were emphasized by Santos (1995) on the basis of wood anatomy, and by Gentry and Tomb (1979) on the basis of pollen characters; these are here all included in *Dolichandra*. Gentry (1973a) also suggested that *Tanaecium*, *Paragonia*, and *Ceratophytum* were closely related, and these are all included here in *Tanaecium*.

While several previously suspected relationships were corroborated by molecular data (Lohmann, 2006), the analyses based on that data also recovered some previously unsuspected relationships. In particular the close relationship between *Sampaiella* and *Adenocalymma*, the sister relationship between *Leucocalantha aromatica* Barb. Rodr. and *Mansoa kerere* (Aubl.) A. H. Gentry, the sister relationship between *Neojobertia* and *Gardnerodoxa*, the close relationship of *Tanaecium nocturnum* (Barb. Rodr.) Bureau & K. Schum. to *Bignonia*, and the close relationship among *Arrabidaea revillae* A. H. Gentry, *Arrabidaea selloi* (Spreng.) Sandwith, and the *Tanaecium* clade were previously unrecognized. When these relationships were studied, several morphological characters were found that also unite those groups. In addition, the overall relationships among genera were completely unclear until the molecular phylogenetic data became available (Lohmann, 2006).

Because the classification presented below is based on a robust molecular phylogenetic analysis backed by morphological evidence, it is expected to be more stable than previous ones. Stability of classification depends on the principle that there are only rarely reasons for dividing a genus into two or more monophyletic genera if its own monophyletic status remains unquestioned, even if smaller monophyletic genera can be recognized by morphological synapomorphies (Stevens, 2001 onwards). This principle is incorporated into the classification adopted here. The genera most deeply changed here in diagnosis and circumscription are *Adenocalymma*, *Amphilophium*, *Dolichandra*, *Fridericia*, and *Tanaecium*. The changes in all of these meet the criterion of considerable alteration (McNeill et al., 2006, Art. 47, Rec. 47A) and are here designated as emendavit (i.e., emended). The diagnosis of *Bignonia* is also changed here from recent usage; however, the characterization of this genus has varied so widely and continually since its original description that there is no stable reference circumscription against which to measure the change here in the classification, and this genus is not formally designated as emended here.

The phylogeny reconstruction on which this classification is based is detailed elsewhere (Lohmann, 2006). In brief, first morphologically similar groups of species linked by putative synapomorphies were identified. Each of these morphological groups was sampled in the phylogenetic study and represented by two or three species; overall about a third of the species currently recognized in the tribe (120 of 393 species) were included in the analysis. Morphologically similar species were studied to ensure that morphological uniformity did not hide molecular variation. Species were sampled from all but one (*Macranthisiphon* Bureau ex K. Schum.) of the 47 genera of the tribe Bignonieae recognized in Gentry's system (Table 2) plus *Perianthomega*, which was previously included in Bignonieae by Baillon (1888) and Schumann (1894) but separated in the tribe Tecomeae by Gentry (1992c). For each species included in the analysis, sequences of the fourth intron of one of the nuclear genes for phosphoenolpyruvate carboxylase (*Pep*C) and the chloroplast gene NADH dehydrogenase subunit 6 (*ndh*F) were obtained, and a morphological study was conducted. The combined molecular data produced a robust phylogeny (Lohmann, 2006), which for clarity is shown here in a simplified tree (Fig. 2). This tree shows only the significant nodes, which are lettered, and the clades that are recognized here with the generic names used.

The issue of which clades should be recognized in a classification is controversial. The classification here follows the principle used by APG (1998: 531) that "classification is not [simply] a matter of grouping according to the principle of monophyly, but it is also a matter of communication." The classification presented here aims to show phylogenetic relationships among taxa and patterns of character evolution. Accordingly, here a clade is regarded as a genus whenever it is a well-supported monophyletic group that can be recognized by one or more morphological synapomorphies. Therefore when small monophyletic genera that have been previously recognized lack diagnostic morphological characters, are too small to be informative about phylogenetic relationships (i.e., only include a few species), or exclude species with similar characters, they are

included within a larger genus circumscription that satisfies the principle of generic recognition used here.

Morphology

A comprehensive morphological matrix with 120 characters was used as a basis to map morphological characters (Lohmann, 2003; Lohmann et al., in prep.) onto the molecular phylogenetic hypothesis of the tribe Bignonieae (Lohmann, 2006). This analysis identified morphological synapomorphies that characterize particular clades, most of which are vegetative rather than reproductive. In addition, several characters were shown to represent useful traits for the identification of particular genera, although they are not strictly synapomorphic. A detailed list of characters that aid in identification of the Bignonieae genera is presented in Tables 3 and 4, and below we present an overview of Bignonieae morphology. See Gentry (1980), Lohmann (2004), and Fischer et al. (2004) for broader descriptions of morphological traits associated with all Neotropical Bignoniaceae; the terminology and interpretation of morphological traits here follow those works.

Dimorphic juvenile growth form. Two genera of Bignonieae, *Amphilophium* and *Dolichandra*, are characterized by small-leaved juvenile forms that differ markedly from the spreading or pendulous reproductive form (Fig. 6C). The juvenile forms grow closely appressed to the bark of the supporting tree, but in each genus the attachment to the tree trunk is different. In *Amphilophium* the stems attach to the bark of the supporting tree by disk-tipped tendrils, while in *Dolichandra* they attach by cat's-claw tendrils. Dimorphic juvenile growth is also found in one species of *Mansoa*, which has disk-tipped tendrils.

Phloem wedges in the stem. The wood anatomy of the tribe Bignonieae is notable for its anomalous secondary growth (Solereder, 1908). This is formed by segments of the cambium that fail to produce secondary xylem while continuing production of phloem (Dobbins, 1971; Pace, 2009, 2011), resulting in a secondary xylem that is interrupted by deep wedges of phloem. All Bignonieae lianas have this uncommon wood structure, which is unknown elsewhere in the family and a synapomorphy of the tribe; however, this is lacking in some Bignonieae species that grow as shrubs. Stems of *Perianthomega* have four phloem arcs (Fig. 17D), while several genera have four phloem wedges (e.g., *Adenocalymma*, *Fridericia*, *Tanaecium*), others consistently have phloem wedges produced in multiples of four (e.g., *Amphilophium*, *Anemopaegma*, *Bignonia*), and *Dolichandra* has multiple dissected phloem wedges that are a synapomorphy of this last genus.

Consistency of the pith. While most members of the tribe Bignonieae have a solid stem pith, a hollow pith is present in *Stizophyllum* and is a synapomorphy of this genus. Gentry (1980) noted that some species of *Pleonotoma* also have stems that may tardily become hollowed with age, but these stems are solid initially.

Branchlet and petiole cross-section shape. In members of the tribe Bignonieae the branchlets may be cylindrical, tetragonal, or hexagonal in cross-section. The shape helps to identify particular clades. However, various branchlet shapes have arisen multiple times in the tribe and are not synapomorphies of any particular clade, except tetragonal stems with the angles winged are a synapomorphy of *Pleonotoma*. Petioles, on the other hand, are generally cylindrical in cross-section throughout the tribe except for those of *Pleonotoma*, which are tetragonal and represent another synapomorphy of this genus.

Petiole and petiolule bases. In most members of the tribe Bignonieae the petioles and petiolules are straight at the base and not articulated. *Adenocalymma* alone has pulvinate and articulated connections between the petioles and petiolules, which represents a synapomorphy for this genus (Fig. 5A, D).

Interpetiolar gland fields. The interpetiolar gland fields are groups of glands borne on the stems between the petioles, which are often present at the nodes in members of the tribe Bignonieae. Their presence has frequently been used to characterize genera. Such glands are found in various genera (e.g., *Fridericia*, *Pachyptera*, *Tanaecium*), and although they have arisen multiple times in Bignonieae (Nogueira et al., 2012b), these traits are often useful for generic identification.

Interpetiolar ridges. The interpetiolar ridges are two transverse ridges on the stem running between the petioles. This character is found in several genera of the tribe, but may vary within a genus. Usually these are developed as two separate or discontinuous ridges, with one on each interpetiolar side of the stem. However, in *Martinella* the interpetiolar ridges are fused to form a continuous ring that completely surrounds the stem, representing a synapomorphy of this genus. Interpetiolar ridges are generally lacking

Table 2. Bignonieae genera recognized under the most significant classification systems.

Don (1838)	de Candolle (1838)	Endlicher (1839)	Meisner (1840, 1843)	de Candolle (1845)	Bureau (1864)	Bentham (1876)	Baillon (1888)	Schumann (1894)	Gentry (1973a to 1993)	Lohmann & Taylor, this publication
Amphilophium	*Amphilophium*	*Amphilophium*	*Adenocalymma* *Amphilophium* *Anemopaegma*	*Adenocalymma* *Amphilophium* *Anemopaegma*	*Adenocalymma* *Amphilophium* *Anemopaegma* *Anisostichus*	*Adenocalymma* *Amphilophium* *Anemopaegma*	*Adenocalymma* *Amphilophium* *Anemopaegma*	*Adenocalymma* *Amphilophium* *Anemopaegma*	*Adenocalymma* *Amphilophium* *Anemopaegma*	*Adenocalymma* *Amphilophium* *Anemopaegma*
Bignonia	*Arrabidaea* *Bignonia*	*Bignonia*	*Arrabidaea* *Bignonia*	*Arrabidaea* *Bignonia*	*Arrabidaea* *Bignonia* *Callichlamys*	*Arrabidaea* *Bignonia* *Callichlamys*	*Arrabidaea* *Bignonia* *Callichlamys*	*Arrabidaea* *Bignonia* *Callichlamys*	*Arrabidaea* *Bignonia* *Callichlamys* *Ceratophytum*	*Bignonia* *Callichlamys*
							Clytostoma *Cremastus*	*Clytostoma* *Cremastus*	*Clytostoma*	
	Cuspidaria		*Cuspidaria*	*Cuspidaria*	*Cuspidaria*	*Cuspidaria*	*Cuspidaria* *Cydista*	*Cuspidaria* *Cydista*	*Cuspidaria* *Cydista* *Distictella*	*Cuspidaria*
			Distictis	*Distictis*	*Distictis* *Dolichandra*	*Distictis*	*Distictis* *Dolichandra* *Doxantha*	*Distictis* *Dolichandra* *Doxantha*	*Distictis* *Dolichandra*	*Dolichandra*
Fridericia	*Fridericia*	*Fridericia*	*Fridericia*	*Fridericia*	*Fridericia*	*Fridericia*	*Fridericia*	*Fridericia*	*Fridericia* *Gardnerodoxa*	*Fridericia*
	Haplolophium	*Haplolophium*	*Haplolophium*	*Haplolophium*	*Haplolophium*	*Glaziova* *Haplolophium*	*Glaziova* *Haplolophium*	*Glaziova* *Haplolophium*	*Glaziova* *Haplolophium* *Leucocalantha*	
	Lundia		*Lundia*	*Lundia* *Macfadyena*	*Lundia* *Macfadyena*	*Lundia* *Macfadyena*	*Levya* *Lundia* *Macfadyena*	*Levya* *Lundia* *Macfadyena* *Macranthisiphon*	*Lundia* *Macfadyena* *Macranthisiphon*	*Lundia*
					Macrodiscus	*Macrodiscus*	*Macrodiscus*	*Macrodiscus*		
	Mansoa		*Mansoa*	*Mansoa*	*Mansoa*		*Mansoa* *Martinella*	*Mansoa* *Martinella*	*Manaosella* *Mansoa* *Martinella*	*Manaosella* *Mansoa* *Martinella*
						Melloa	*Melloa* *Memora* *Mussatia* *Neojobertia* *Neomacfadyena*	*Melloa* *Memora* *Mussatia* *Neojobertia* *Neomacfadyena*	*Melloa* *Memora* *Mussatia* *Neojobertia*	*Neojobertia*
			Pachyptera	*Pachyptera*	*Pachyptera*					*Pachyptera*
								Parabignonia	*Parabignonia*	

Table 2. Continued.

Don (1838)	de Candolle (1838)	Endlicher (1839)	Meisner (1840, 1843)	de Candolle (1845)	Bureau (1864)	Bentham (1876)	Baillon (1888)	Schumann (1894)	Gentry (1973a to 1993)	Lohmann & Taylor, this publication
							Paragonia	*Paragonia*	*Paragonia*	
							Paramansoa	*Paramansoa*		
							Perianthomega	*Perianthomega*		*Perianthomega*
									Periarrabidaea	
							Petastoma			
							Phadranthus	*Phaedranthus*		
							Phryganocydia	*Phryganocydia*	*Phryganocydia*	
									Piriadacus	
			Pithecoctenium	*Pithecoctenium*	*Pithecoctenium*	*Pithecoctenium*	*Pithecoctenium*	*Pithecoctenium*	*Pithecoctenium*	
							Pleonotoma	*Pleonotoma*	*Pleonotoma*	*Pleonotoma*
									Potamoganos	
									Pseudocatalpa	
			Pyrostegia				*Pyrostegia*	*Pyrostegia*	*Pyrostegia*	*Pyrostegia*
									Roentgenia	
					Saldanhaea		*Saldanhaea*	*Saldanhaea*		
							Sanhilaria	*Sanhilaria*		
									Saritaea	
			Schizopsis							
							Setilobus	*Setilobus*		
									Spathicalyx	
							Stizophyllum	*Stizophyllum*	*Stizophyllum*	*Stizophyllum*
			Tanaecium	*Tanaecium*			*Tanaecium*	*Tanaecium*	*Tanaecium*	*Tanaecium*
				Tynanthus			*Tynanthus*	*Tynanthus*	*Tynanthus*	*Tynanthus*
									Xylophragma	*Xylophragma*

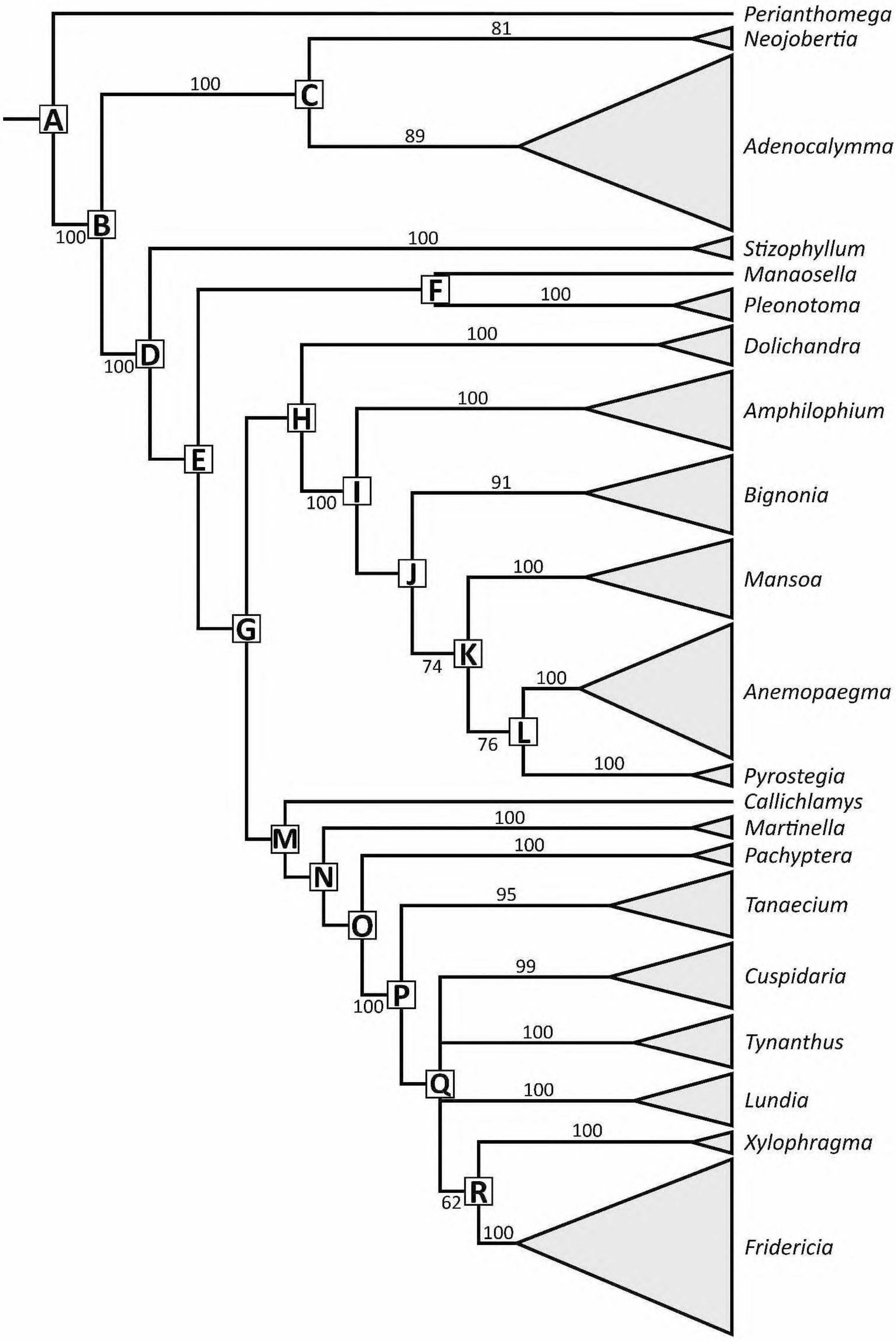


Figure 2. Schematic diagram summarizing phylogenetic relationships among the genera of Bignonieae, with nodes labeled by letters and the genera recognized labeled as terminal taxa. Relationships within the Core Bignonieae clade are those hypothesized by the molecular analyses of Lohmann (2006); support values are from the combined molecular results, except for values for the Bignonieae (node A), Core Bignonieae clade (node B), and *Neojobertia–Adenocalymma* clade (node C), which are taken from analyses of *ndhF* alone.

Table 3. Vegetative characters useful in recognizing genera; characters within parentheses are less common.

	Dimorphic juvenile growth	Phloem wedges in stem	Branchlet section	Interpetiolar gland field	Prophylls of axillary buds	Leaf type	Tendril type
Adenocalymma	absent	four	cylindrical	absent (present)	subulate, or foliaceous	2- or 3-foliolate, biternate, or biternate-pinnate	simple (trifid)
Amphilophium	present (absent)	multiples of four	hexagonal, or cylindrical	absent	foliaceous	2- or 3-foliolate	trifid (multifid) with disks
Anemopaegma	absent	multiples of four	cylindrical	absent (present)	foliaceous, or minute	2- or 3(5)-foliolate	trifid (simple)
Bignonia	absent	multiples of four	cylindrical, and/or tetragonal	absent	bromeliad, foliaceous (minute)	2- or 3-foliolate	simple (minutely trifid, or multifid)
Callichlamys	absent	four	cylindrical	absent	minute	2- or 3-foliolate	simple
Cuspidaria	absent	four	cylindrical (tetragonal)	present	minute	2- or 3-foliolate (biternate)	simple
Dolichandra	present	multiple dissected	cylindrical	present (absent)	subulate	2- or 3-foliolate	trifid and cat's claw
Fridericia	absent	four	cylindrical	present (absent)	minute	1-, 2-, or 3-foliolate	simple
Lundia	absent	four	cylindrical	present	minute	2- or 3-foliolate	simple, or trifid
Manaosella	absent	four	cylindrical	absent	minute	2- or 3-foliolate	multifid with disks
Mansoa	absent (present)	multiples of four	cylindrical, becoming angular	absent (present)	minute, or bromeliad	2- or 3-foliolate	trifid
Martinella	absent	four	cylindrical, or tetragonal	absent	minute	2- or 3-foliolate	trifid
Neojobertia	absent	four	hexagonal	absent	subulate	biternate, or biternate-pinnate	trifid, multifid
Pachyptera	absent	four	cylindrical, or tetragonal	present	minute, or ensiform	2- or 3-foliolate	trifid
Perianthomega	absent	four	cylindrical	absent	minute	biternate	simple
Pleonotoma	absent	four	tetragonal	absent	foliaceous	biternate, or biternate-pinnate	trifid
Pyrostegia	absent	multiples of four	hexagonal	absent	minute	2- or 3-foliolate	trifid
Stizophyllum	absent	four	cylindrical	absent	foliaceous	2- or 3-foliolate	trifid
Tanaecium	absent	four	cylindrical (tetragonal)	absent, or present	bromeliad, or subulate	2- or 3-foliolate	simple (bifid), or trifid
Tynanthus	absent	four	cylindrical	absent	minute, or foliaceous	2- or 3-foliolate	trifid
Xylophragma	absent	four	cylindrical	present	minute, or bromeliad	2- or 3(5)-foliolate	simple

Table 4. Reproductive characters useful in recognizing genera; characters within parentheses are less common.

	Inflorescence type	Calyx shape	Corolla color	Corolla indument	Ovules series per placenta	Fruit shape	Fruit ornamentation
Adenocalymma	raceme (thyrse)	cupular	yellow (white or red)	puberulous (villose)	one	linear or elliptic	smooth
Amphilophium	raceme or thyrse	cupular	yellow or white (magenta, pink, or red)	puberulous, villose	many	elliptic	tuberculate or echinate
Anemopaegma	raceme, cyme, compound thyrse, or fascicle	cupular	yellow (white or red)	puberulous (villose)	many	orbicular	smooth
Bignonia	cyme, thyrse, raceme, or fascicle	cupular or tubular	magenta, pink (yellow, white, or red)	glabrous, puberulous, or villose	one	linear or elliptic	smooth, echinate, or tuberculate
Callichlamys	raceme	spathaceous	yellow	puberulous	many	elliptic	smooth
Cuspidaria	compound thyrse	cupular	magenta or pink (red)	glabrous or villose	two	linear	smooth, with two ridges, or winged
Dolichandra	cyme or thyrse	cupular or spathaceous	yellow or red	glabrous	many (one)	linear (elliptic)	smooth, tuberculate, or winged
Fridericia	compound thyrse (thyrse)	cupular or tubular (urceolate)	magenta or pink (white or red)	villose (glabrous)	one	linear	smooth
Lundia	compound thyrse	cupular (tubular)	white (red)	villose	two	linear	smooth or ridged (winged)
Manaosella	raceme	spathaceous	yellow (magenta or pink)	glabrous	two	linear	smooth
Mansoa	thyrse (fascicle)	cupular	magenta or pink	puberulous	two	linear	smooth or ridged (tuberculate)
Martinella	thyrse	tubular	magenta, or pink, or red	glabrous	one	linear	smooth
Neojobertia	raceme at base, thyrse at apex	tubular or spathaceous	yellow or red	glabrous	one	linear	smooth
Pachyptera	raceme	tubular	white	villose	one	linear	smooth
Perianthomega	raceme	tubular	white	glabrous	one	linear	smooth
Pleonotoma	raceme	cupular, tubular	white or yellow	glabrous, puberulous	two	linear	smooth
Pyrostegia	corymb	cupular	orange or white	puberulous	two	linear	smooth
Stizophyllum	raceme	urceolate	magenta or white	pubescent	two	linear	smooth
Tanaecium	thyrse or cyme	cupular	yellow, magenta, or white	villose	one (two)	linear (elliptic)	smooth
Tynanthus	compound thyrse	cupular	white	villose	two	linear	smooth or winged
Xylophragma	compound thyrse (thyrse)	cupular	magenta or pink	villose	many	linear	smooth

in taxa with interpetiolar glands, although this is not a strict correlation.

Prophylls of the axillary buds. Even though members of the family Bignoniaceae lack stipules, the scales of the axillary buds are often enlarged and modified into stipule-like structures, which have sometimes been referred to as pseudostipules (e.g., Gentry, 1980) or cataphylls; these structures are here called prophylls. Prophylls may be minute and triangular (Fig. 11K), leaflike (i.e., foliaceous and green; Figs. 5C, 11A, 11F, 11J, 11O, 11S), subulate (Fig. 11E), bromeliad-like (Fig. 18B), or ensiform and usually rigid (Fig. 17B). The term bromeliad-like (e.g., Gentry, 1980) refers to an axillary bud with several prophylls that are generally subulate-lanceolate in shape and tightly grouped or whorled, and resemble a small plant of the Bromeliaceae; these are found in several genera. Most of these prophyll forms have arisen multiple times in the tribe, but the combination of bromeliad-like and leaflike prophylls in the same individual is unique to species of *Bignonia*, and ensiform prophylls arranged in multiple series are unique to *Pachyptera*. Our knowledge of this character is currently limited, and detailed morphological and developmental study is needed.

Vegetative odor. A strong smell of clove in the foliage is unique to and a synapomorphy of *Tynanthus*, while a strong smell of garlic is a synapomorphy of *Mansoa*. These strong odors are thought to be associated with chemical defense against herbivores.

Leaf form. The leaves of most members of the tribe Bignonieae are (1)2- or 3(or 5)-foliolate with the terminal leaflet modified into a tendril (e.g., Figs. 9C, 10A, 14E). Biternately compound (Fig. 5D) or biternately pinnate (Fig. 5A) leaves with the terminal blade usually modified into a tendril are present in several early-diverging lineages of Bignonieae. Among these lineages, only *Perianthomega* has exclusively biternately compound leaves that lack tendrils, and it also has petioles that are twining and modified as tendrils (Fig. 17C).

Leaflets. The leaflets in members of the tribe Bignonieae are generally well developed, and very generally elliptic to ovate. The venation is pinnate, and most often eucamptodromous to festooned-broquidodromous (e.g., Figs. 7A, 7D, 7G, 7J, 7O). In some species, the basalmost pair of secondary axes is very well developed and the venation approaches triplinerved. The lamina is pellucid-punctate in

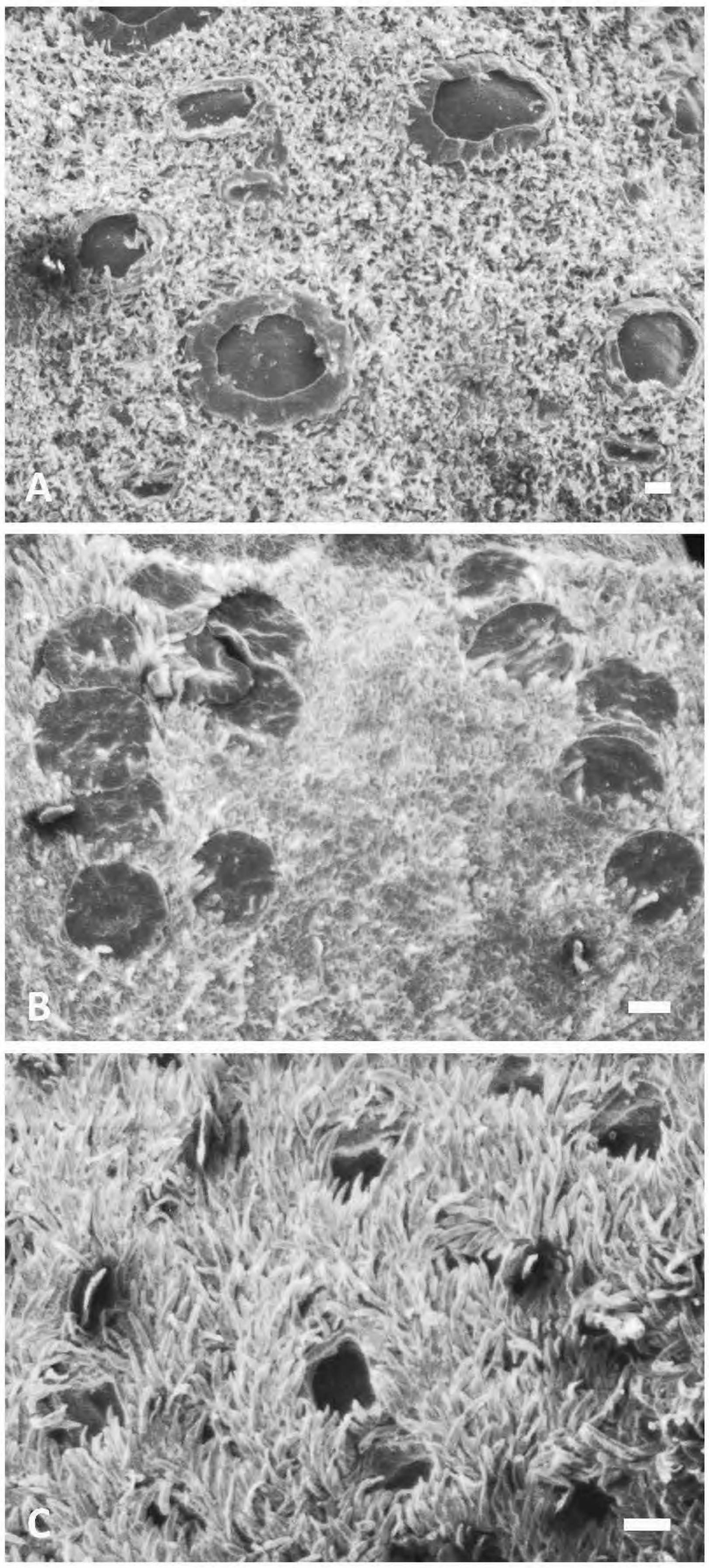


Figure 3. Calyx glands in Bignonieae. —A. Volcano-shaped glands of *Adenocalymma* Mart. ex Meisn., exemplified by *A. trichocladum* (DC.) L. G. Lohmann. —B. Plate-shaped glands of most Bignonieae, as represented by *Fridericia spicata* (Bureau & K. Schum) L. G. Lohmann. —C. Glands immersed in the epidermis of *Amphilophium* Kunth, as shown by *A. mansoanum* (DC.) L. G. Lohmann. Magnification bars = 100 μm. A illustrated from *Daly et al. 560* (MO); B from *Pires et al. 795* (MO); C from *Hatschbach et al. 28074* (MO).

Stizophyllum, as well as in some species of *Pyrostegia* and *Amphilophium*, and often has patelliform (i.e., saucer-shaped or plate-shaped), peltate, and/or stipitate trichomes distributed sparsely across it and/or in the vein axils on both surfaces (Nogueira et al., 2013).

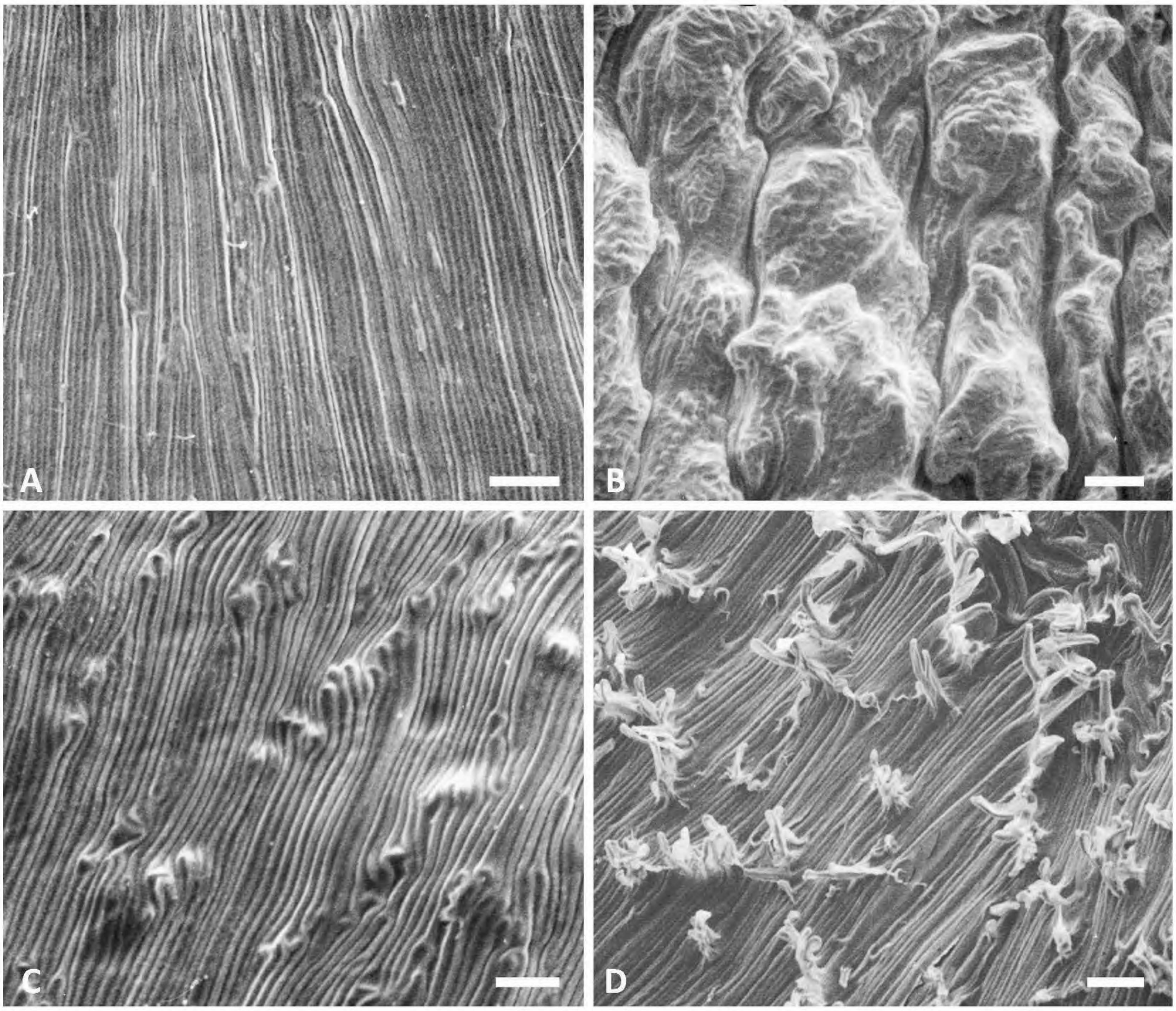


Figure 4. Seed coat in Bignonieae. —A. Smooth seed coat found in most Bignonieae, as shown by *Fridericia rego* (Vell.) L. G. Lohmann. —B. Rough seed coat of *Neojobertia* Baill., exemplified by *N. candolleana* (Mart. ex DC.) Bureau & K. Schum. C, D. Papillate seed coat found in *Amphilophium* Kunth. —C. *Amphilophium granulosum* (Bureau & K. Schum.) L. G. Lohmann. —D. *Amphilophium lohmanniae* (A. Pool) L. G. Lohmann. Magnification bars = 100 μm. A illustrated from *Folle 3989* (MO); B from *Alencar 577* (MO); C from *Prance 22656A* (MO); D from *Lohmann & da Silva 20* (MO).

Tendril type. The tendrils vary from simple, trifid, or bifid to multifid (i.e., each segment is parted into three multiple times), and the different forms have arisen repeatedly in the tribe Bignonieae (Lohmann, 2003; Sousa-Baena et al., 2013, 2014; Lohmann et al., in prep.). *Amphilophium* and one species of *Mansoa* have trifid tendrils with the tips modified into adhesive disks, while *Manaosella* alone has multifid tendrils with the tips modified into adhesive disks. The tendrils of *Dolichandra* are also unique, with thickened and bent segments or arms forming a clawlike or uncinate structure.

Inflorescence type. Taxonomic use of inflorescence type has been rather neglected in Bignoniaceae. Any branching inflorescence has generally been referred to as paniculate in a broad sense by earlier workers (e.g., Gentry, 1973a, 1973b, 1976, 1979). However, several different inflorescence types can be distinguished within this tribe, including cymes, racemes, corymbs, thyrses, compound thyrses, and fascicles. While most inflorescence types have arisen multiple times in Bignonieae (Lohmann, 2003; Lohmann et al., in prep.) and thus are not unique to any particular genus, corymbose inflorescences are a synapomorphy of *Pyrostegia*.

Calyx form. The calyx is usually a large and significant structure in the tribe Bignonieae, and its form varies widely in this tribe. This character has been one of the most widely used to distinguish genera of this tribe (e.g., Gentry 1973a, 1973b, 1976, 1979), although there is wide variation in calyx form within many genera. Gentry himself (1980) noted that

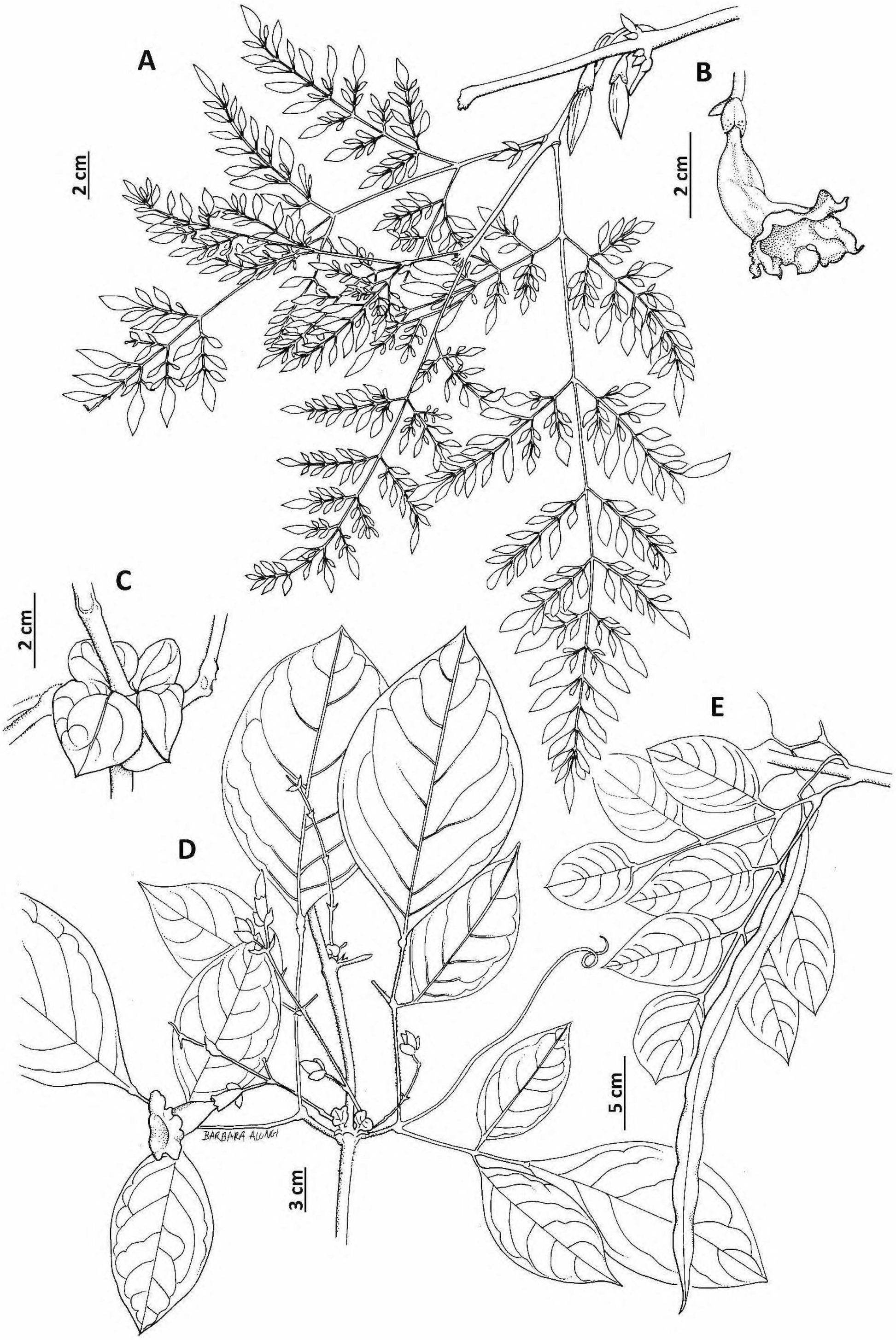


Figure 5. Representative morphological traits of *Adenocalymma* Mart. ex Meisn. A, B. *Adenocalymma moringifolium* (DC.) L. G. Lohmann. —A. Flowering branch showing biternately pinnate leaves. —B. Flower. C–E. *Adenocalymma adenophorum* (Sandwith) L. G. Lohmann. —C. Foliaceous prophylls. —D. Flowering branch showing biternately compound leaves. —E. Fruit. A, B illustrated from *Lohmann et al. 13* (MO); C, D from *Lohmann et al. 14* (MO); E from *Lohmann et al. 30* (MO).

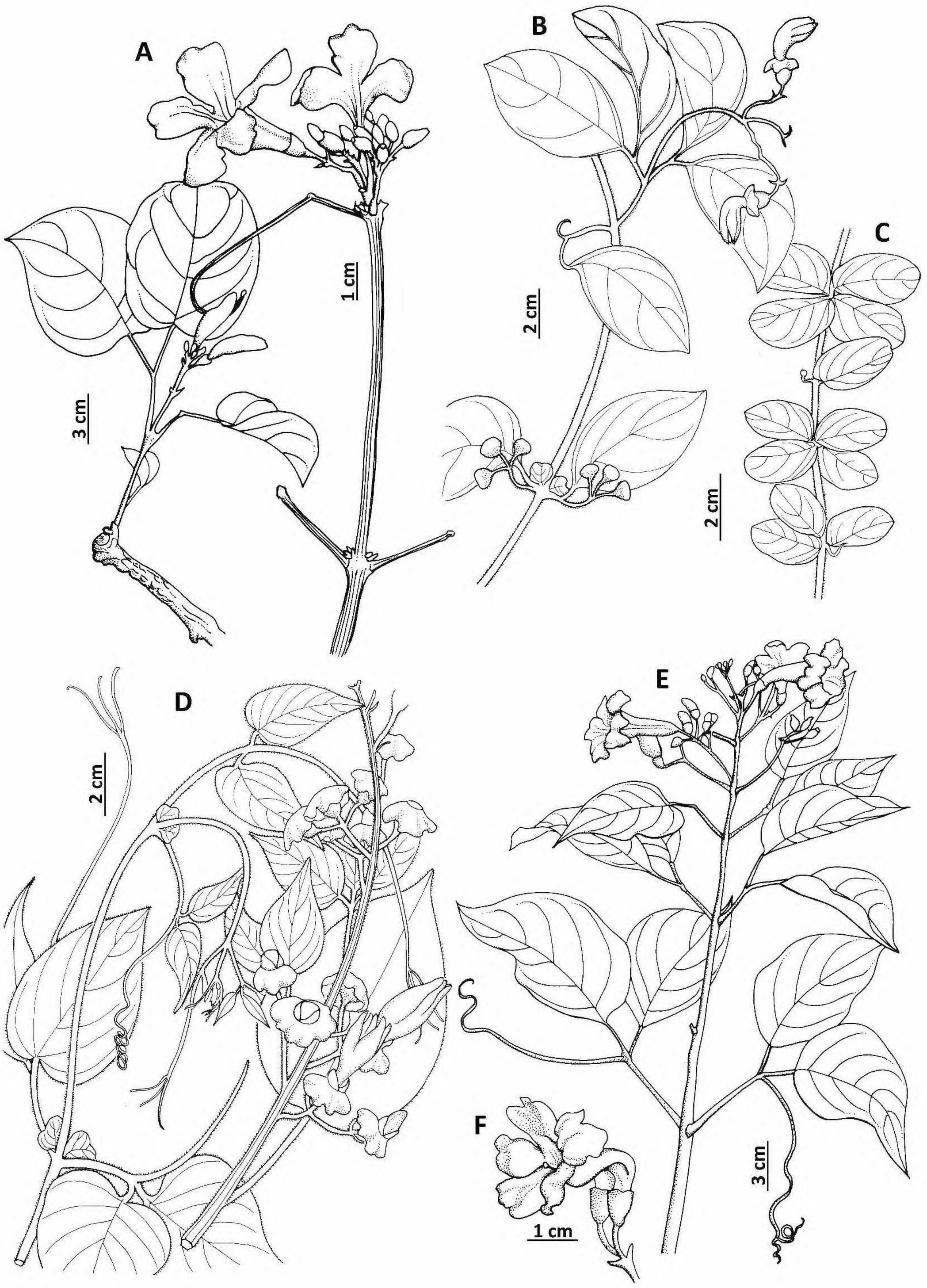


Figure 6. Representative morphological traits of *Amphilophium* Kunth. —A. *Amphilophium pulverulentum* (Sandwith) L. G. Lohmann (this species was previously included in *Distictis* Mart. ex Meisn.), flowering branch. B, C. *Amphilophium bauhinioides* (Bureau ex Baill.) L. G. Lohmann (previously in *Glaziova* Bureau). —B. Flowering branch. —C. Dimorphic juvenile form. —D. *Amphilophium aschersonii* Ule, flowering branch. —E, F. *Amphilophium elongatum* (Vahl) L. G. Lohmann (previously in *Distictella* Kuntze). —E. Flowering branch. —F. Flower. A illustrated from *Hopkins 1551* (MO); B from *Kuhlmann 6510* (MO); C from *Lutz 2066* (MO); D from *Vigo 7276* (MO); E, F from *Lohmann et al. 70* (MO).

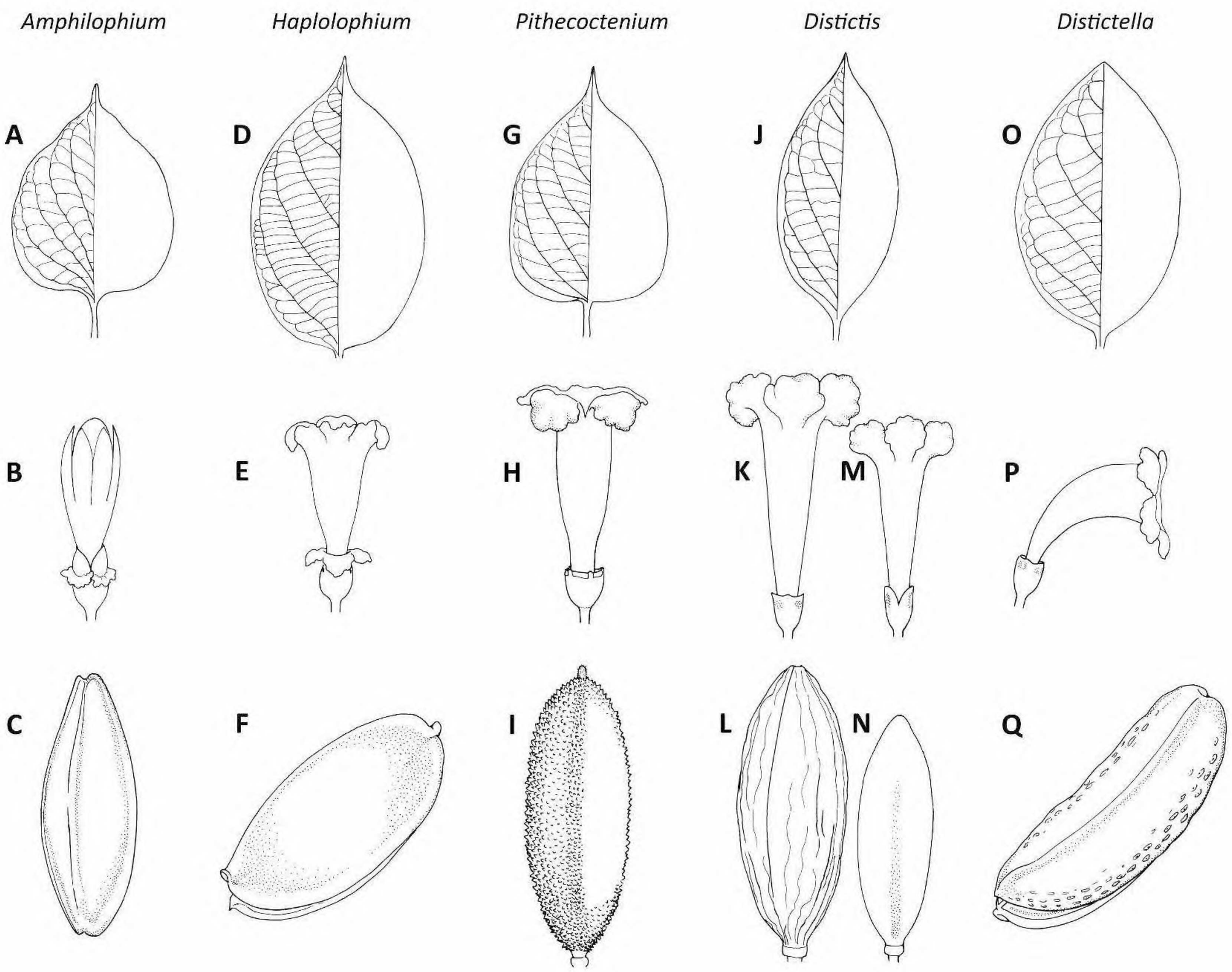


Figure 7. Comparison of leaves (top row), flowers, and fruits (in lower rows, respectively) among different species of *Amphilophium* Kunth; names above columns indicate the genera in which these species were previously included. A–C. *Amphilophium paniculatum* (L.) Kunth. D–F. *Amphilophium rodriguesii* (A. H. Gentry) L. G. Lohmann. G–I. *Amphilophium crucigerum* (L.) L. G. Lohmann. J–L. *Amphilophium buccinatorium* (DC.) L. G. Lohmann. M, N. *Amphilophium pulverulentum* (Sandwith) L. G. Lohmann. O–Q. *Amphilophium magnoliifolium* (Kunth) L. G. Lohmann. A, B illustrated from *Zardini & Velazquez 18163* (MO); C from *Croat s.n.* (MO); D, E from *Solomon 6295* (MO); F from *Cremers et al. 12485* (MO); G–I from *Zardini 6224* (MO); J–L from *Boutin 1900* (MO); M, N from *Gentry et al. 21308* (MO); O, P from *Allen et al. 3210* (MO); Q from *Boutin 3317* (MO).

this infrageneric variation has been underappreciated, and also that calyx form varies markedly within some individual species. The general calyx shape ranges from cupular to tubular or urceolate, with the form of its opening varied. The calyx is usually truncate to usually 5-lobed, with the lobes triangular and short to well developed or occasionally filiform. The calyx may also be regularly to irregularly bilabiate, to 3- or 4-lobed, occasionally spathaceous (i.e., fused completely in bud and opening by a lateral slit) in a few genera such as *Callichlamys* (Fig. 13A), *Manaosella* (Fig. 16F), and some species of *Neojobertia* (Fig. 16C), or calyptrate (i.e., fused and with the top portion dehiscing transversally or in a circumscissile fashion) in *Lundia* (Kaehler et al., 2012). The double-calyx form found in *Amphilophium* is notable (Figs. 6D, 7B, E), with the calyx divided circumferentially in its middle or upper part into two concentric layers, one that encloses the corolla (the "Manschette" or cuff, Schumann, 1894: 203–204; the "thick inner margin," Gentry, 1980: 17) and another layer external to it that often spreads and is crisped, similarly to a skirt (the "Anhang" or appendage, Schumann, 1894: 203–204; the "submarginal rim," Gentry, 1980: 17). Several appendages are also produced on the outside of the calyx limb in at least one species of *Bignonia*. The texture of the calyx also varies markedly, generally from membranaceous to coriaceous except in *Callichlamys*, where this is spongy (Fig. 13A).

Calyx glands. Glands in the calyx of members of the tribe Bignonieae exude a sugary nectar that attracts ants, which presumably play an important role in the protection of the flower from nectar robbers that would otherwise puncture the corolla at the base of the tube

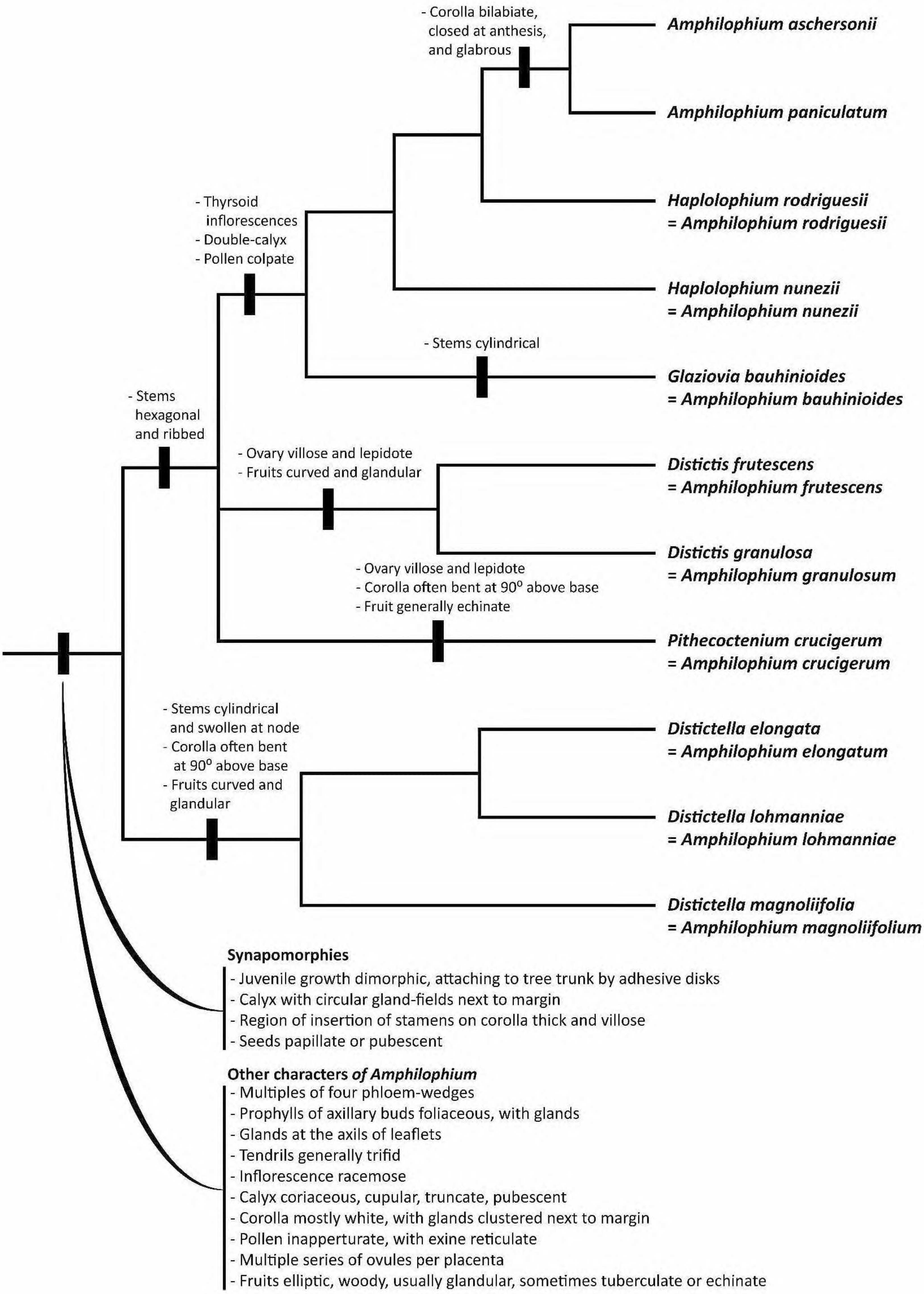


Figure 8. Phylogenetic hypothesis of *Amphilophium* Kunth, with morphological characters mapped on the diagram. Names of the terminal taxa indicate the genera in which these species were previously included and changes in the classification proposed here are indicated. The synapomorphies represent unique characters that diagnose the genus; the other characters are found in *Amphilophium* and additionally describe the genus. Relationships depicted follow Lohmann (2006).

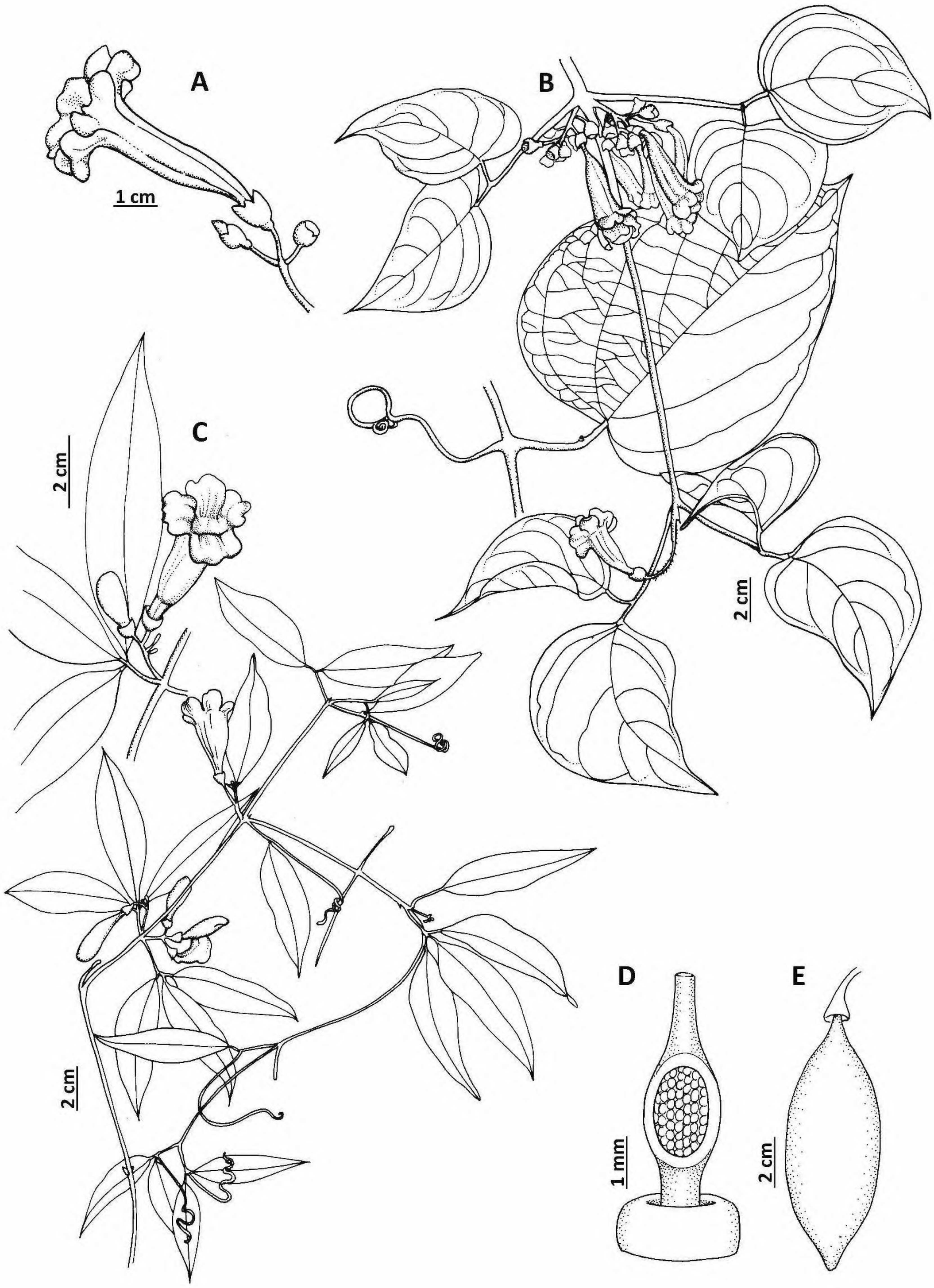


Figure 9. Representative morphological traits of *Anemopaegma* Mart. ex Meisn. A, B. *Anemopaegma oligoneuron* (Sprague & Sandwith) A. H. Gentry. —A. Flower. —B. Flowering branch. C–E. *Anemopaegma foetidum* Bureau & K. Schum. —C. Flowering branch. —D. Stipitate ovary. —E. Stipitate and orbiculate fruit. A, B illustrated from *Lohmann et al. 76* (MO); C, D from *de Souza et al. 252* (MO); E from *Sothers et al. 1017* (MO).

to steal nectar (Gentry, 1974a). These glands are generally patelliform (Fig. 3B), and are variously scattered over the calyx, grouped near the margins, or occasionally solitary along the margins (some species of *Fridericia*) or arranged in lines (*Pachyptera*, *Pleonotoma*). In two genera the glands are unusual in being deeply immersed in the epidermis. Investigation of the ultrastructure of these unusual glands found those of *Amphilophium* (Fig. 3C) to be otherwise similar to the surface glands, but the immersed glands of *Adenocalymma* to be different. These last are urceolate or tubular in form with extended margins that protrude above the leaf surface (Fig. 3A), a form apparently restricted to this genus and here called volcano-shaped glands.

Corolla. Corolla shape and color have been the predominant characters used to diagnose genera in previous classification systems (e.g., de Candolle, 1845; Bureau, 1864; Baillon, 1888; Gentry, 1973a). Gentry (1974a) in particular catalogued several distinctive corolla forms that he used to distinguish several genera. However, phylogenetic reconstructions of selected flower traits show that particular corolla colors and most of the corolla forms have arisen multiple times within this tribe (Lohmann, 2003; Alcantara & Lohmann, 2010, 2011), and this together with the similar variation in fruit morphology explain in large part why previous classifications of the tribe Bignonieae have been unstable and phylogenetically unsatisfactory. In general the corollas in the tribe Bignonieae are rather large (2–6 cm long), white to brightly colored and often also marked with nectar guides, weakly to markedly zygomorphic, and 5-lobed. The corollas vary widely among the species in a number of features including color and color pattern, size, and orientation of the lobes. Only three genera of Bignonieae, *Amphilophium*, *Tynanthus*, and *Bignonia*, have unique corolla morphologies (the Amphilophium-type, the Tynanthus-type, and the Mimetic-type, respectively; Gentry, 1974a; Alcantara & Lohmann, 2010), which are synapomorphies of these genera. The corolla tube and lobes of *Amphilophium* are unique in their thick texture of the outer surface and internally at the region of the stamen insertion, which presumably is an adaptation for carpenter-bee pollination (Gentry, 1974a; Fig. 6F). The corollas of *Tynanthus* are relatively small (up to ca. 1 cm long), and bilabiate with the two upper lobes fused (Fig. 18E); they are thought to be adapted for butterfly pollination (Gentry, 1974a). The corollas of *Bignonia* are flattened abaxially and have nectar guides, even though they lack nectar disks; these flowers are thought to be adapted for pollination by deceit, in which pollination is dependent on exploratory visits by nectar-seeking bees (Gentry, 1974a; Umaña et al., 2011).

Corolla glands. Most genera of the tribe Bignonieae lack glands on the corolla, but these are present in a few genera. The corolla glands are arranged in lines in the upper (i.e., distal) part of the corolla tube in *Adenocalymma*, *Anemopaegma*, and *Pachyptera*, and in lines near the corolla margins in *Amphilophium*.

Corolla aestivation. All members of the tribe Bignonieae have imbricate corolla aestivation. *Pyrostegia* was once thought to have valvate aestivation (e.g., de Candolle, 1845; Miers, 1863; Schumman, 1894; Bureau & Schumman, 1896; Gentry, 1973b), but detailed analysis of this character (Pool, 2008) found that although the lobes are valvate at their bases, their apices are imbricate. This unusual arrangement is a synapomorphy of this genus.

Stipitate ovary. The ovaries of members of the tribe Bignonieae are sessile except for those of *Anemopaegma*, which are distinctly stipitate (Fig. 9D). This structure persists on the fruits, which are also stipitate, and is a synapomorphy of the genus (Fig. 9E).

Stamens. As noted by Gentry (1980), the androecium varies markedly within the family Bignoniaceae, but much less within the tribe Bignonieae. In general members of the tribe Bignonieae have four didynamous stamens with well-developed filaments and one posterior staminode, except for one species of *Tanaecium* that has two stamens and no staminodes. In most members of the tribe, the anthers are glabrous; *Lundia* is separated in part by its villous anthers, but pubescent anthers are also found in a few species of some other genera (e.g., *Pachyptera*). The anthers are bithecal, and the arrangement of the thecae varies. In most of the tribe the thecae are parallel, but sometimes they are attached at the apex and separated below that attachment with the bases spreading or divergent. Several genera have unusual anthers with forward-curved thecae: in these the thecae are attached at their apices, and have their bodies curved in a U shape so their bases are ascending and often positioned above their apices (*Cuspidaria*, *Tynanthus*, some species of *Fridericia*).

Fruit characters. All members of the tribe Bignonieae have septicidal capsules, and this is a synapomorphy of this tribe (Gentry, 1980; Olmstead et al., 2009). Fruit dehiscence has in fact been the main character used in the tribal classification of Bignoniaceae (e.g., Don, 1838; de Candolle, 1845; Bureau, 1864; Schumann, 1894; Gentry, 1992c), although anatomical and ontogenetic study is still needed to determine if fruit dehiscence is indeed a

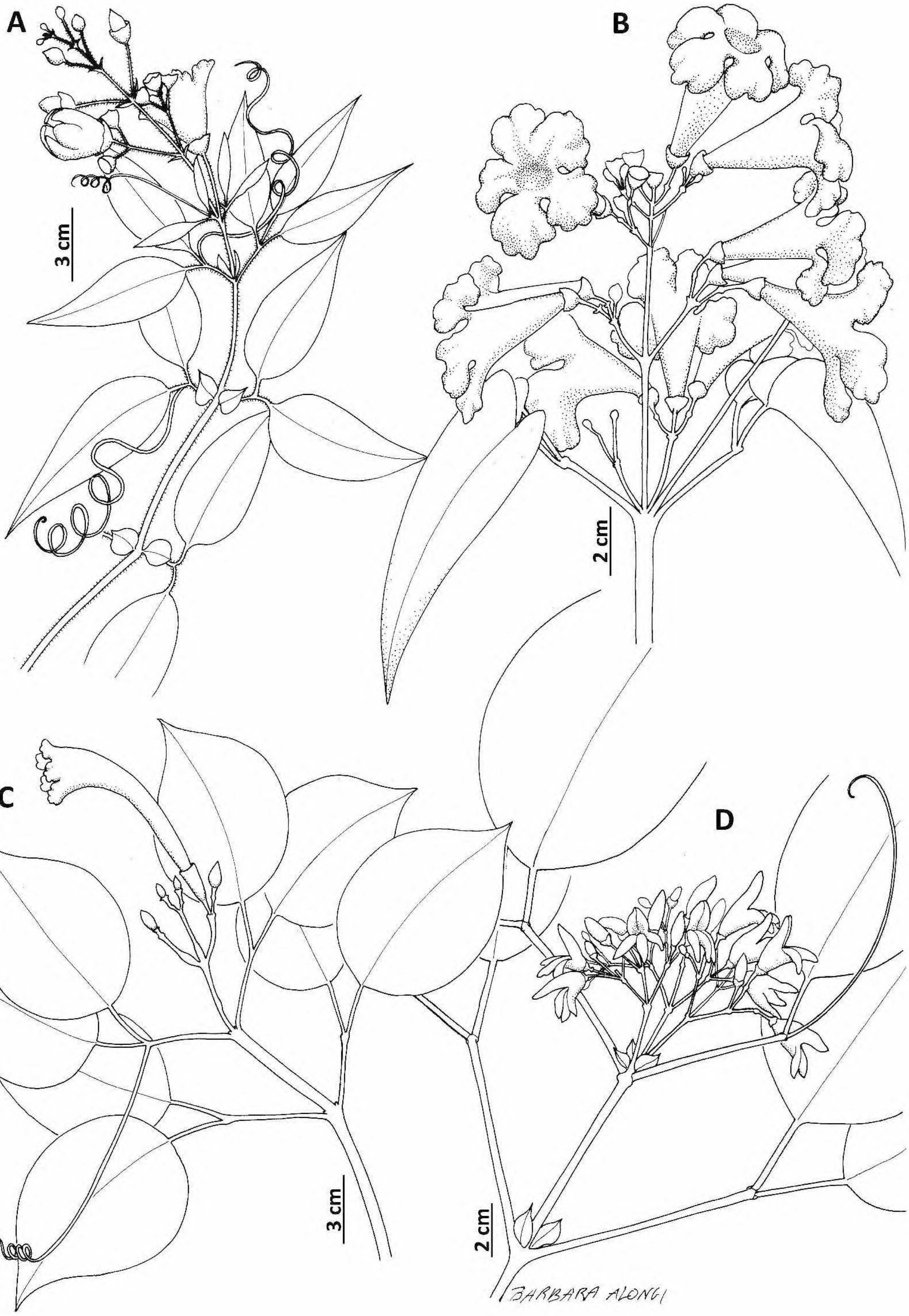


Figure 10. Morphological diversity in *Bignonia* L. —A. Flowering branch of *Bignonia campanulata* Cham. (this species was previously included in *Clytostoma* Miers ex Bureau). —B. Flowering branch of *B. aequinoctialis* L. (previously in *Cydista* Miers). —C. Flowering branch of *B. nocturna* (Barb. Rodr.) L. G. Lohmann (previously in *Tanaecium* Sw.). —D. Flowering branch of *B. prieurii* DC. (previously in *Mussatia* Bureau ex Baill.). A illustrated from *Lombardi 2526* (MO); B from *Gillespie & Persaud 1198* (MO); C from *Cogollo & Cardenas 4480* (MO); D from *Schunke 5010* (MO).

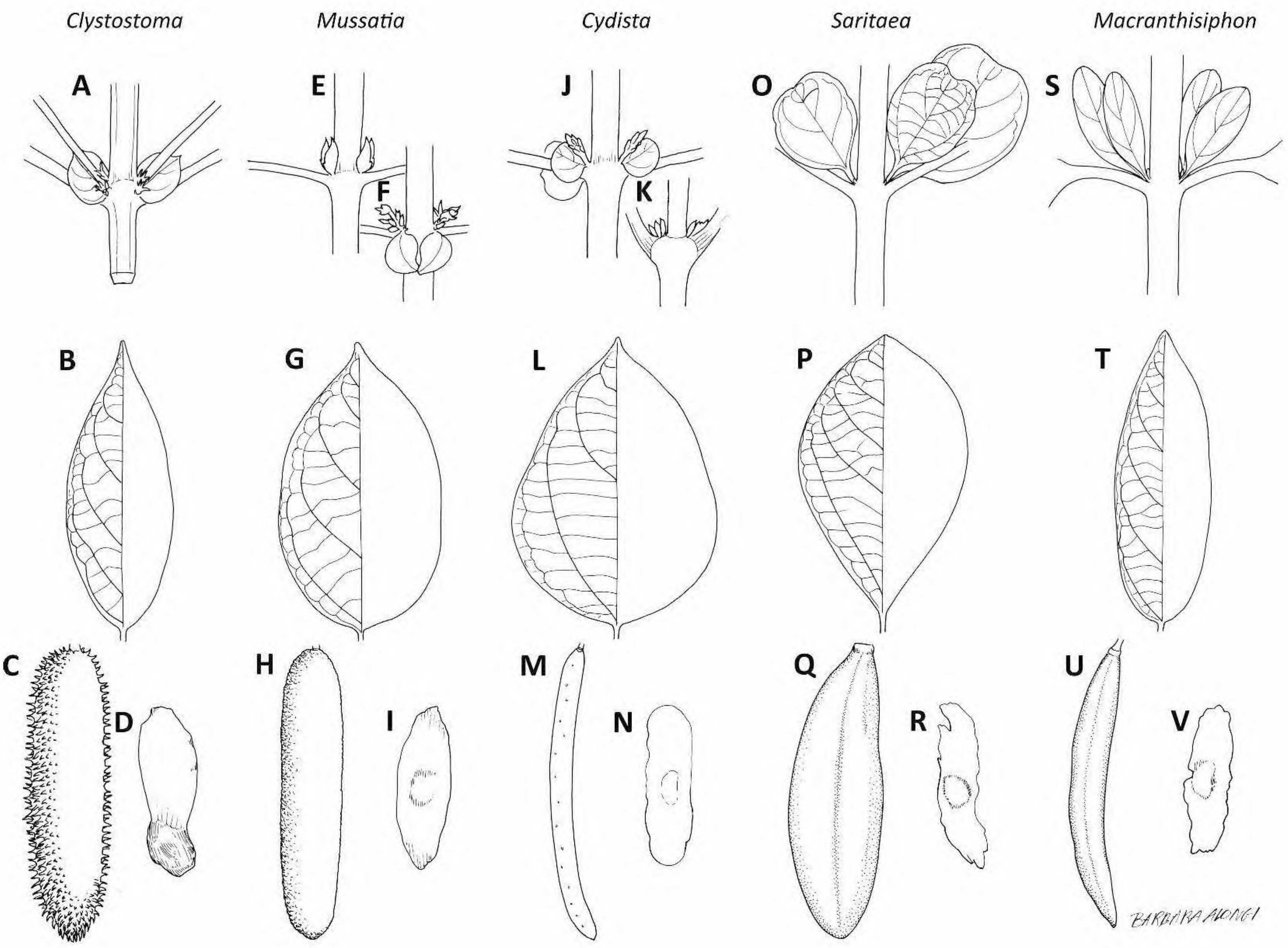


Figure 11. Comparison of prophylls of the axillary buds (top row), leaves, and fruits (lower two rows), with seeds seen to right of fruits, among different species of *Bignonia* L.; names above columns indicate the genera in which these species were previously included. A–D. *Bignonia campanulata* Cham. E–I. *Bignonia hyacinthina* (Standl.) L. G. Lohmann. J–N. *Bignonia aequinoctialis* L. O–R. *Bignonia magnifica* W. Bull. S–V. *Bignonia longiflora* Cav. A–D illustrated from *Hoehne 3773* (MO); E–G from *Schunke 5010* (MO); H, I from *Saldias et al. 2934* (MO); J–N from *McDaniel 11860* (MO); O, P from *Gentry et al. 15454* (MO); Q, R from *Cuadros et al. 3446* (MO); S–V from *Hansen et al. 7978* (MO).

character that diagnoses large clades within the family (Olmstead et al., 2009). Within the tribe Bignonieae fruit shape and ornamentation are among the least stable characters, even though they have been commonly used to delimit genera in previous classification systems. This together with the similar variation in corolla form and color explain in large part why previous classifications of Bignonieae have been unstable and phylogenetically unsatisfactory. The only fruit character that is unique to a single clade of Bignonieae is the 4-parted arrangement of the mature fruit valves in *Dolichandra*, versus 2-parted in the other members of the tribe.

Seed coat. The seed coat or surface is smooth in most of the Bignonieae (Fig. 4A). However, the seeds are papillate to pubescent in *Amphilophium* (Fig. 4C, D), and this condition is a synapomorphy for the genus. In addition, the seeds are rough in *Neojobertia* (Fig. 4B) and *Xylophragma*.

Taxonomic Treatment

The new generic classification of Bignonieae here is based on both morphological and molecular study of this group, as summarized above and detailed elsewhere (Lohmann, 2003, 2006; Lohmann et al., in prep.). The names and relationships of the genera recognized here are shown in the schematic phylogeny presented in Figure 2. A modified natural key is given here to the genera, following this schematic phylogeny: somewhat differently from an artificial key, the main purpose of this natural key is to outline the characters and relationships of the clades or natural groups. In this key, the leads summarize the characterization of each of the genera being separated in the order in which they appear on the phylogeny; therefore, sometimes some of the cited character states are not completely exclusive in contrasting leads of a couplet. For further insights into the identification of genera see Tables 3 and 4. The taxonomic treatment of the individual genera details their component species. In the morphological

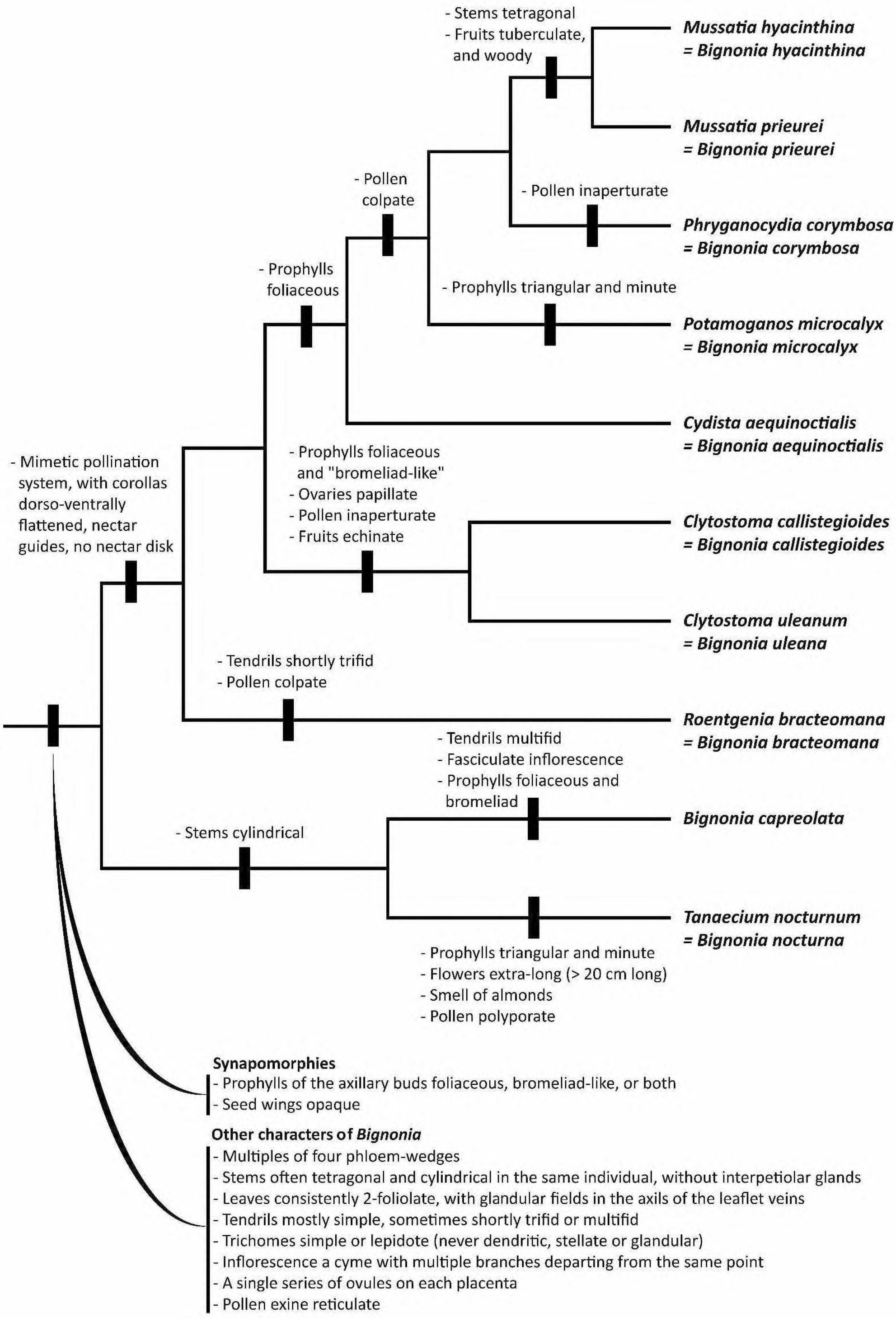


Figure 12. Phylogenetic hypothesis of *Bignonia* L. with morphological characters mapped on the diagram. Names of the terminal taxa indicate the genera in which these species were previously included and changes in the classification proposed here are indicated. The synapomorphies represent unique characters that diagnose the genus; the other characters are found in *Bignonia* and additionally describe the genus. Relationships depicted follow Lohmann (2006).

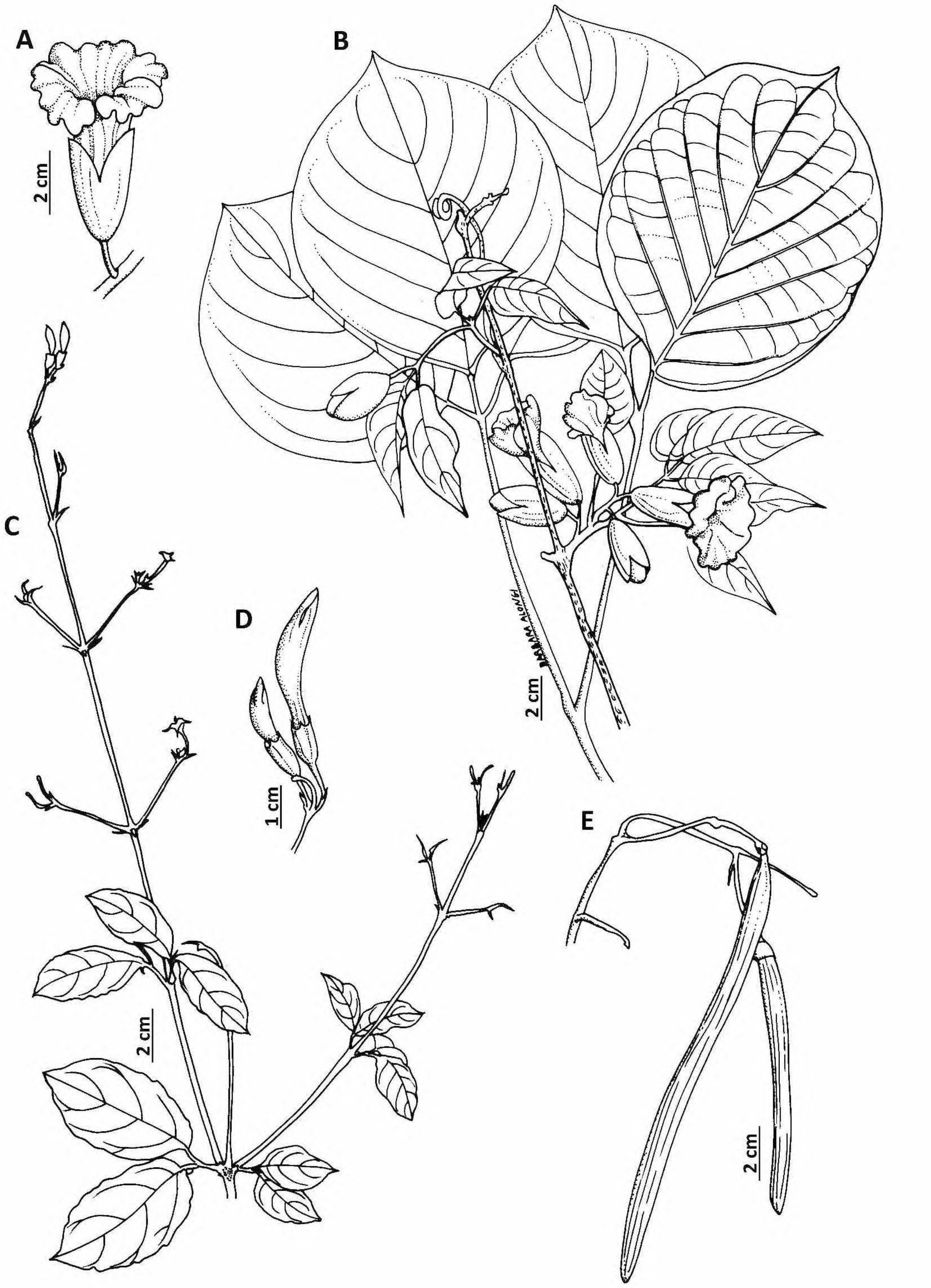


Figure 13. Representative morphological traits of *Callichlamys* Miq. and *Cuspidaria* DC. A, B. *Callichlamys latifolia* (Rich.) K. Schum. —A. Flower. —B. Flowering branch. C–E. *Cuspidaria cinerea* (Bureau ex K. Schum.) L. G. Lohmann. —C. Flowering branch. —D. Flower buds. —E. Fruits. A, B illustrated from *Costa et al. 211* (MO); C–E from *Lohmann et al. 34* (MO).

descriptions, the character states noted in parentheses are rarely occurring ones. The list of the species of Bignonieae here summarizes the current knowledge of the group, and forms the basis for monographic studies of this tribe (Lohmann, 2003; Lohmann et al., in prep.).

All accepted names are listed here, and in a few cases also synonyms that clarify past confusions, clarify changes of names for well-known species, or represent revised species circumscriptions used here. Presentation of full synonymy is beyond the scope of this work; most of this synonymy can be found in iPlants (<http://www.iplants.org/>). In general, invalid names are not cited here, except in several cases where these have been widely used and have generated nomenclatural confusion. The nomenclatural discussions and citations of particular Articles of the International Code of Botanical Nomenclature are based on McNeill et al. (2006). Formal nomenclatural author and reference abbreviations follow usage in TROPICOS®, and herbarium acronyms follow Index Herbariorum (<http://sweetgum.nybg.org/ih/>). The genera are treated here in alphabetical order, and within each genus, the species are treated in alphabetical order. Specimen data and images of living plants and representative specimens can be found in TROPICOS® (<http://www.TROPICOS.org/>), which includes A. H. Gentry's specimen database and photographs. The geographic range information given here is intended to generally describe the species distributions and is based on literature plus a georeferenced dataset that includes 30,000 specimen records (Lohmann, unpubl. data). Maps illustrating the distributions of representative species have been published elsewhere (Lohmann et al., 2013), and maps for the remaining taxa based on georeferenced specimens can be obtained upon request from the first author. Countries with relatively small surface areas are listed individually; for countries with larger areas, the main political units (states, provinces, or departments) in which the species are documented are also detailed.

Types were examined for most of the species treated here. Typification of the names treated here is done as far as possible, but typification of all names is beyond the scope of the present work. Typification is done here in particular for names published by Vellozo, Jacquin, Bureau, and Schumann. The lectotypification and neotypification here are all done by L. G. L., and should be credited solely to her.

Vellozo (1825 [1829], 1827 [1831]; also spelled Velloso or Veloso, Stafleu & Cowan, 1986) described and illustrated many new genera and species in his treatment of the Bignoniaceae in his *Flora Fluminensis*. Most of Vellozo's names were based on his own collections from southern Brazil, mainly Rio de Janeiro and Minas Gerais, which were deposited at the herbarium R in Rio de Janeiro. These specimens are apparently all lost (Stafleu & Cowan, 1986: 697), making the plates from *Flora Fluminensis* the only existing authentic materials of Vellozo. Gentry (1975) reviewed Vellozo's Bignoniaceae names and confirmed their identities in modern taxonomy, but did not lectotypify them. Vellozo's plates are here designated as lectotypes for several of his names, following recommendations by Ross (2002).

Jacquin also did not designate types for several of the taxa that he described, making lectotypification necessary. Whenever Jacquin mentioned that his description was based on his own collection from a particular locality, lectotypes or neotypes have usually not been designated here. For these names the types are here provisionally designated as *Jacquin s.n.* pending further study, unless original materials have already been traced. Jacquin's original specimens do survive in many cases and are often deposited at BM or W, with specimens also dispersed among various European herbaria (Stafleu & Cowan, 1979: 407), so locating this material is feasible but difficult. In addition, several species described by Jacquin were based on specimens of other collectors (D'Arcy, 1970). In some cases Jacquin made no reference to materials that he examined and his plates are here designated as lectotypes.

Chamisso (1832) stated that his treatment of the Bignoniaceae was based on the collections of Friedrich Sellow (also spelled Sello, Stafleu & Cowan, 1985) from Brazil, but he gave no collection numbers for the specimens that he cited. Several numbered specimens of Sellow's collections were photographed at the Berlin Museum (B) in the Field Museum's type photograph series, because these were catalogued as types of various Bignonieae species that Chamisso described. These and other Sellow duplicates distributed to various herbaria help confirm the identity of Chamisso's names, and when the Field Museum photo confirms that the B specimen represents the correct species, that specimen number is presumed to be the type number. However, Chamisso's original herbarium is deposited at LE (Stafleu & Cowan, 1976: 482) and is presumed to contain the holotypes of his names (unless the name was specifically based on a specimen deposited elsewhere). It may eventually be necessary to lectotypify some of Chamisso's names, but this cannot be done until the Bignonieae types of the

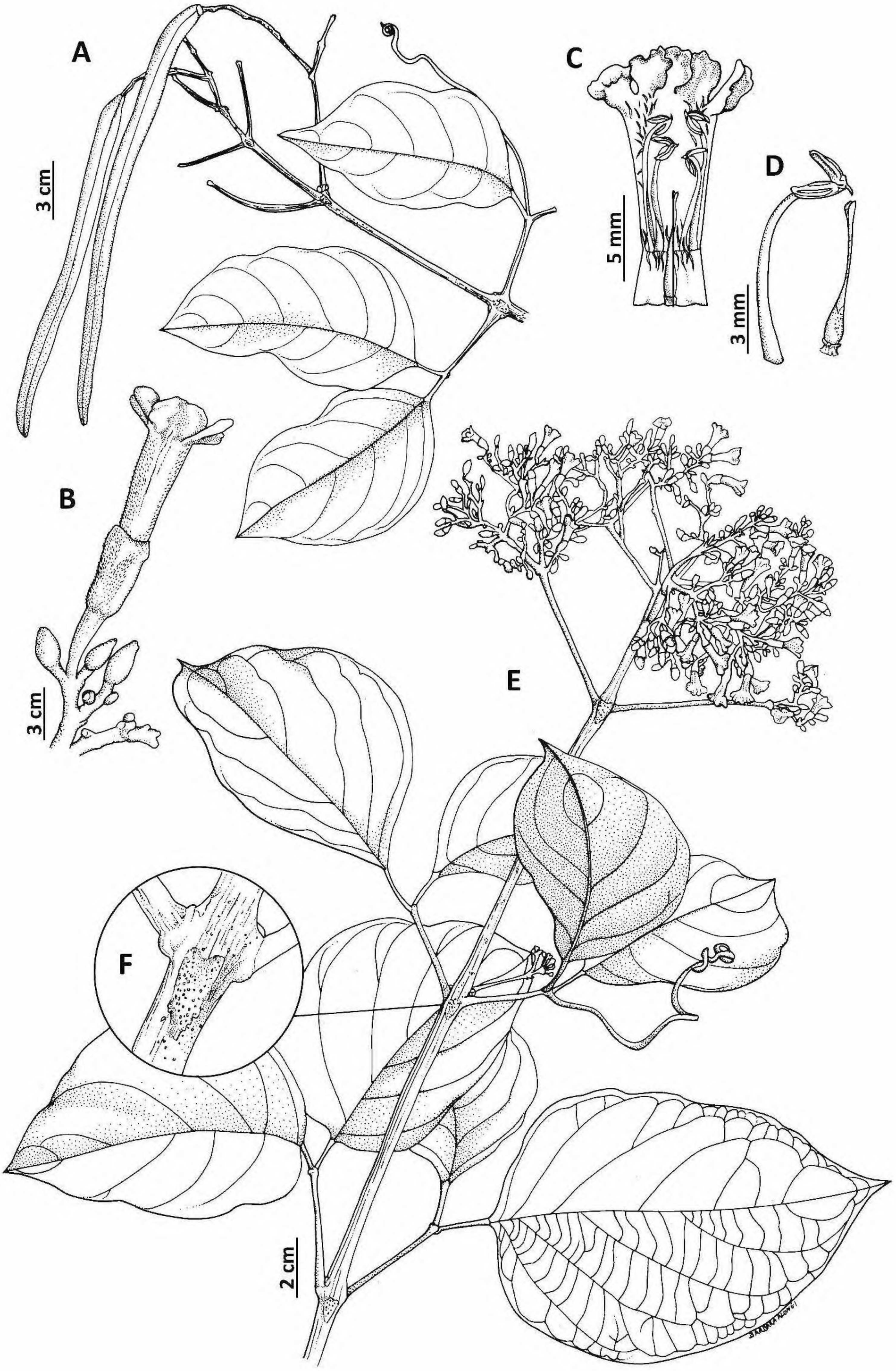


Figure 14. Representative morphological traits of *Fridericia* Mart. A–F. *Fridericia trailii* (Sprague) L. G. Lohmann. —A. Fruiting branch. —B. Flower and flower buds. —C. Opened flower. —D. Stamen and gynoecium, with the gynoecium at right. —E. Flowering branch. —F. Detail of the interpetiolar glands. A illustrated from *Costa et al. 65* (MO); B–F from *Lohmann et al. 29* (MO).

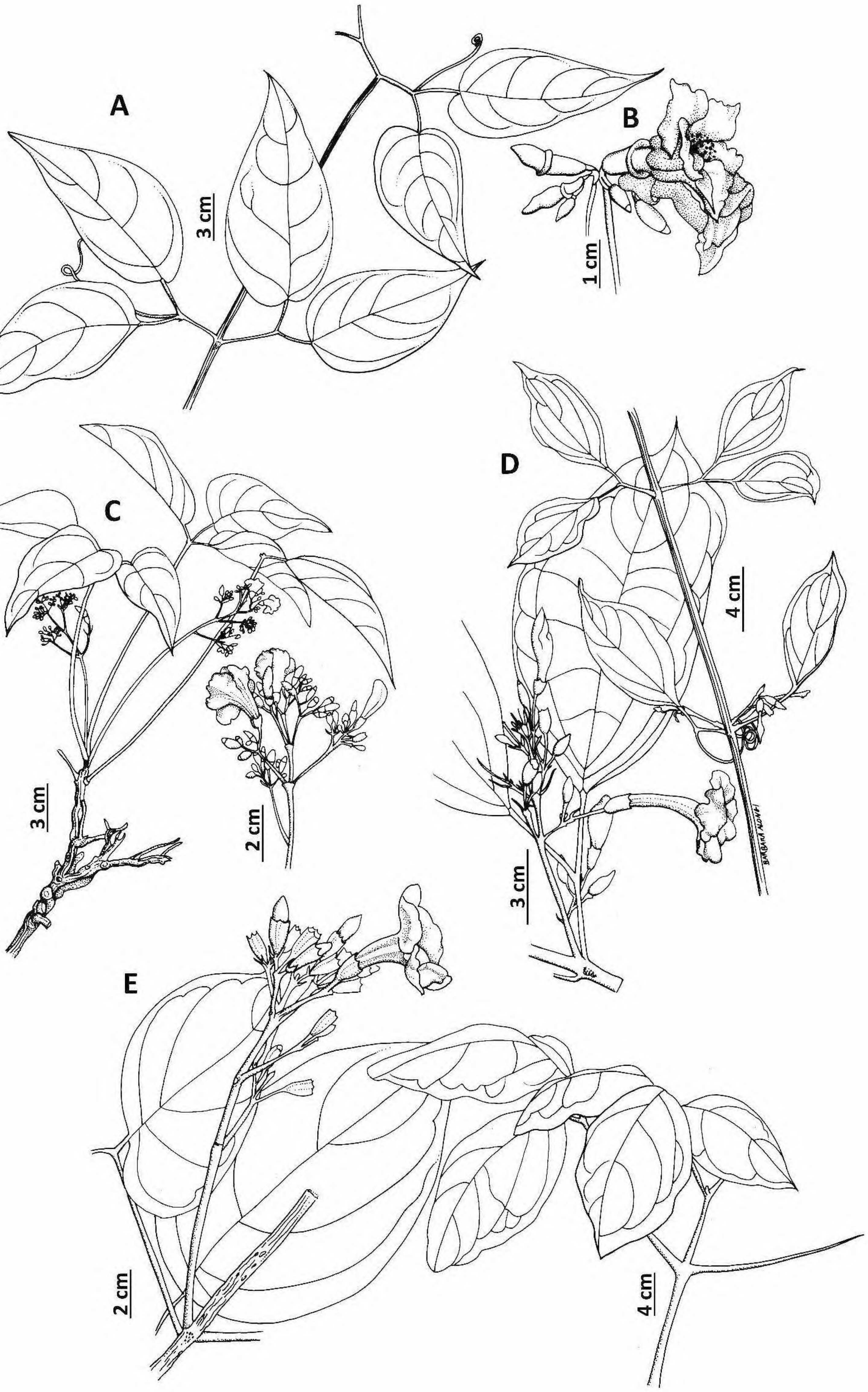


Figure 15. Morphological diversity in *Fridericia* Mart. A, B. *Fridericia triplinervia* (Mart. ex DC.) L. G. Lohmann. —A. Branch. —B. Flowers. —C. *Fridericia chica* (Bonpl.) Verl., flowering branch and flowers. —D. *Fridericia prancei* (A. H. Gentry) L. G. Lohmann, flowering branch. —E. *Fridericia nigrescens* (Sandwith) L. G. Lohmann, flowering branch. A, B illustrated from *Lohmann et al. 11* (MO); C from *Gentry 12816* (MO); D from *Sothers et al. 460* (MO); E from *Assunção et al. 430* (MO).

LE herbarium are studied; therefore Chamisso's names are not lectotypified here pending that work.

Schumann in his synoptic overview of the Bignoniaceae for the *Pflanzenfamilien* (1894) did not cite collections for any of the new species he described, but the Bignonieae species he named there were contemporaneously detailed by Bureau and Schumann (1896) in the *Flora Brasiliensis*. These two works were presumably prepared in close coordination, and the specimens cited by Bureau and Schumann are here considered to be original material of the species Schumann named in the *Pflanzenfamilien*. The general collection of Neotropical Bignoniaceae specimens at B was destroyed during World War II (Hiepko, 1987), which resulted in the loss of all of Schumann's original materials. These destroyed types are indicated in the text by the dagger symbol (†). Lectotypifications are made here when possible for names that were based on types lost there, but further study is necessary before this can be done in several cases.

Parts of this new classification have already been published, due to varying publication schedules in overlapping floristic works. In particular, several of the nomenclatural combinations supported by the phylogeny of Bignonieae (Lohmann, 2006) were previously cited by Arbo and Lohmann (2008) and Lohmann (2008a, 2008b, 2010) in regional checklists. The necessary new nomenclatural combinations were all intended to be published in the comprehensive classification here, and were cited in those regional checklists in anticipation of this present article but not in a form intended for valid publication. However, because of its format those new names were validly published by Lohmann (2008a), where all the nomenclatural requirements (McNeill et al., 2006) were met: the name was clearly accepted in the work (Art. 34.1), the new combination was explicitly and fully given (Art. 33.1), and the basionym was given with its place of publication (Art. 33.4). The names cited by these other works did not satisfy this last requirement and are not validly published.

Tribe Bignonieae Dumort., Anal. Fam. Pl. 23. 1829. (Bignoniaceae). TYPE: *Bignonia* L.

Lianas, shrubs, or rarely treelets, with juvenile growth infrequently dimorphic, glabrous or pubescent with various types of trichomes including simple, glandular, dendritic, lepidote, and stellate; stems generally with (without) anomalous secondary growth produced by atypical cambia forming 4 to 32 phloem wedges in various arrangements, with pith solid (hollow); branchlets cylindrical, tetragonal, or hexagonal in cross-section, with interpetiolar glands and/or an interpetiolar ridge sometimes present; prophylls of axillary buds minute and triangular, bromeliad-like, ensiform, foliaceous, or subulate, sometimes with glands. Leaves (1)2- or 3(or 5)-foliolate, biternately compound, or biternately pinnate, with terminal division often replaced by a simple, bifid, trifid, or multifid tendril, this with or without adhesive disks; leaflets frequently with glands, pellucid punctations, and/or domatia of various forms. Inflorescence terminal and/or axillary, a thyrse, compound thyrse, raceme, cyme, corymb, or fascicle. Flowers with calyx cupular, tubular, or urceolate, variously truncate, 2- to 5-lobed, spathaceous opening by a lateral slit, or calyptrate and circumscissile, sometimes appendaged, without or frequently with glands; corolla tubular to infundibuliform, white, yellow, cream, pink, magenta, orange, or red, lobes 5, in bud imbricate (valvate at base and imbricate at apex); stamens (2 or)4 with 1(no) posterior staminode, didynamous, thecae 2, parallel to divergent or forward-curved; ovary bilocular, with placentation axile, placentas 4, each with 1 to many ovules in varied arrangements; stigmas 2; nectar disk present (absent). Fruit capsular, septicidal, widely varied in form and ornamentation, valves 2(4); seeds smooth (rough or pubescent to papillose), winged (unwinged).

This tribe includes 21 genera with 393 species, all of them Neotropical except *Bignonia capreolata* L., which is found in the warm-temperate southeastern United States.

Natural Key to Genera of Tribe Bignonieae

1a. Leaves biternately compound, with leaf divisions never replaced by tendrils; petioles frequently becoming woody and twining ..... XV. *Perianthomega*

1b. Leaves 1- to 5-foliolate, biternately compound, or biternately pinnate, with terminal divisions often replaced by tendrils; petioles not twining, woody, or tendril-like (Fig. 2, node B).

2a. Leaves biternately compound or biternately pinnate; branchlets hexagonal in cross-section; tendrils trifid or multifid ..... XIII. *Neojobertia*

2b. Leaves 1- to 5-foliolate, biternately compound, or biternately pinnate, branchlets cylindrical, irregularly angled, or tetragonal, and tendrils simple or bifid, OR sometimes branchlets hexagonal in cross-section and then leaves 1- to 3-foliolate and tendrils trifid or multifid, OR sometimes tendrils trifid or multifid and then leaves 2- to 5-foliolate and branchlets cylindrical, irregularly angled, or tetragonal.

3a. Petioles articulated at stem and petiolules articulated at petioles; calyx and fruit with volcano-shaped glands ..... I. *Adenocalymma*

3b. Petioles and petiolules not articulated; calyx and fruit with patelliform or immersed glands (Fig. 2, node D).
4a. Stems with hollow pith; leaflets with pellucid punctations; fruits linear and narrow (i.e., less than 1 cm wide) ..... XVIII. *Stizophyllum*
4b. Stems with solid pith, or pith tardily becoming hollow in some species of *Pleonotoma*; leaflets generally without pellucid punctations, OR with pellucid punctations and then stems with solid pith; fruit elliptic to linear, more than 1.5 cm wide (Fig. 2, node E).
5a. Tendrils multifid with the segments ending in adhesive disks ..... X. *Manaosella*
5b. Tendrils simple, bifid, trifid, or multifid and without adhesive disks, OR with trifid and rarely multifid both found on the same plant and the segments ending in adhesive disks.
6a. Petioles tetragonal in cross-section; branchlets tetragonal in cross-section, with angles acute and winged; leaves biternately compound or biternately pinnate ..... XVI. *Pleonotoma*
6b. Petioles cylindrical in cross-section; branchlets cylindrical, tetragonal, or hexagonal in cross-section, without angles or with angles but these not winged; leaves 1- to 5-foliolate, OR if leaves biternately compound then branchlets cylindrical (Fig. 2, node G).
7a. Stems in cross-section with phloem wedges in multiples of 4, or with multiple dissected phloem wedges (Fig. 2, node H).
8a. Stems in cross-section with multiple dissected phloem wedges; tendrils trifid with uncinate tips; fruit incompletely to completely 4-parted ..... VII. *Dolichandra*
8b. Stems in cross-section with multiples of 4 phloem wedges; tendrils simple, bifid, trifid, or multifid, with tips not uncinate; fruit 2-parted (Fig. 2, node I).
9a. Juvenile growth dimorphic; tendrils with segments terminating in adhesive disks; corolla coriaceous; fruit elliptic, with valves woody; seeds pubescent or papillate ..... II. *Amphilophium*
9b. Juvenile growth similar to adult, or dimorphic in one species of *Mansoa*; tendrils without adhesive disks; corolla membranaceous; fruit linear or elliptic, with valves woody or coriaceous; seeds glabrous and smooth (Fig. 2, node J).
10a. Prophylls of the axillary buds foliaceous and bromeliad-like or minute and triangular; tendrils simple, minutely trifid, or multifid; calyx coriaceous; and seed wings opaque ..... IV. *Bignonia*
10b. Prophylls of the axillary buds triangular and minute, elliptic and foliaceous, and/or bromeliad-like; tendrils simple or trifid; calyx coriaceous or membranaceous; and seed wings opaque, hyaline, or absent, with characters not found in the above combination (Fig. 2, node K).
11a. Branchlets cylindrical, becoming angled to ribbed; foliage with strong garlic odor; corolla magenta; ovary glabrous or villose; pollen exine areolate; fruits woody, with midrib frequently developed into a conspicuous ridge, with calyx caducous ..... XI. *Mansoa*
11b. Branchlets cylindrical and smooth; foliage without garlic odor; corolla red, orange, yellow, or cream; ovary lepidote; pollen exine reticulate; fruits coriaceous, not ridged, with calyx persistent (Fig. 2, node L).
12a. Branchlets cylindrical in cross-section; prophylls of axillary buds elliptic and foliaceous or minute and triangular, with glands; leaflets without pellucid punctations; inflorescence a raceme, fascicle, cyme, or compound thyrse; corolla infundibuliform, white, yellow, or red, with glands arranged in lines, the lobes with complete imbricate aestivation; stamens included; ovules in multiple series on each placenta; fruit elliptic and stipitate ..... III. *Anemopaegma*
12b. Branchlets hexagonal in cross-section; prophylls of axillary buds minute and triangular, without glands; leaflets with pellucid punctations; inflorescence a corymb; corolla narrowly tubular, orange or white, without glands, the lobes with valvate aestivation at their bases and imbricate aestivation at their apices; stamens exserted; ovules biseriate on each placenta; fruit linear and without stipe ..... XVII. *Pyrostegia*
7b. Stems in cross-section with 4 phloem wedges (Fig. 2, node M).
13a. Calyx spathaceous and spongy ..... V. *Callichlamys*

13b. Calyx cupular, urceolate, or tubular and 2- to 5-parted, truncate, spathaceous, or calyptrate, membranaceous to coriaceous but not spongy (Fig. 2, node N).
14a. Branchlets with a continuous ring-shaped ridge surrounding the interpetiolar region; calyx irregularly 3- to 4-lobed ..... XII. *Martinella*
14b. Branchlets without interpetiolar ridges or with discontinuous interpetiolar ridges; calyx bilabiate, 5-lobed, truncate, or spathaceous (Fig. 2, node O).
15a. Older branchlets with papery peeling epidermis or bark; calyx with glands arranged in a line ..... XIV. *Pachyptera*
15b. Older branchlets with smooth, non-peeling epidermis or bark; calyx without glands, with solitary glands near margins, or with glands clustered in fields near margins (Fig. 2, node P).
16a. Calyx bilabiate; prophylls of axillary buds subulate and/or bromeliad-like ..... XIX. *Tanaecium*
16b. Calyx truncate, bilabiate, 5-parted, spathaceous, or calyptrate; prophylls of axillary buds minute and triangular, foliaceous, or bromeliad-like (Fig. 2, node Q).
17a. Prophylls of axillary buds foliaceous or minutely triangular, without or with glands; foliage with clove odor; corolla less than 2 cm long, strongly bilabiate . . . . XX. *Tynanthus*
17b. Prophylls of axillary buds minutely triangular or bromeliad-like, without glands; foliage without clove odor; corolla more than 4 cm long, not bilabiate.
18a. Calyx truncate, shortly 5-parted, calyptrate (i.e., splitting transversally), without glands; ovary, anthers, and stigma pubescent; nectar disk absent . . .. IX. *Lundia*
18b. Calyx truncate or deeply 5-parted, lobed (i.e., splitting longitudinally), with glands; ovary lepidote, anthers and stigma glabrous; nectar disk present.
19a. Ovules arranged in 2 series on each placenta; anthers with thecae forward-curved; fruit valves with midrib divided into 2 longitudinal ridges ..... VI. *Cuspidaria*
19b. Ovules arranged in 1 or multiple series on each placenta; anthers with thecae straight, OR thecae forward-curved and ovules arranged in 1 series on each placenta; fruit valves not ridged (Fig. 2, node R).
20a. Ovules arranged in a single series on each placenta ..... VIII. *Fridericia*
20b. Ovules arranged in multiple series on each placenta ..... XXI. *Xylophragma*

I. Adenocalymma Mart. ex Meisn., Pl. Vasc. Gen. 1: 300, 2: 208. 1840, orth. cons. vs. *Adenocalymna*, emend. L. G. Lohmann. TYPE: *Adenocalymma comosum* (Cham.) DC. (lectotype, designated by Sandwith [1962: 453]).

Memora Miers, Proc. Roy. Hort. Soc. London 3: 185. 1863. TYPE: *Memora schomburgkii* (DC.) Miers (lectotype, designated by Sandwith [1962: 454]) [≡ *Adenocalymma schomburgkii* (DC.) L. G. Lohmann].

Pharseophora Miers, Proc. Roy. Hort. Soc. London 3: 186. 1863, syn. nov. TYPE: *Pharseophora fallax* (Cham.) Miers, Proc. Roy. Hort. Soc. London 3: 186. 1863, nom. superfl. illeg. [= *Adenocalymma pubescens* (Spreng.) L. G. Lohmann].

Odontotecoma Bureau & K. Schum., Fl. Bras. 8(2): 305. 1897. TYPE: *Odontotecoma fulgens* Bureau & K. Schum. [= *Adenocalymma cymbalum* (Cham.) Bureau & K. Schum.].

Sampaiella J. C. Gomes, Rodriguésia 12: 107. 1949, syn. nov. TYPE: *Sampaiella trichoclada* (DC.) J. C. Gomes [≡ *Adenocalymma trichocladum* (DC.) L. G. Lohmann].

Lianas or shrubs, without dimorphic juvenile growth, without strong odor; stems with 4 phloem wedges in cross-section, pith solid; branchlets cylindrical, glabrous to pubescent, covered with lenticels, without interpetiolar glands (with glands in *Adenocalymma trichoclada*), with discontinuous interpetiolar ridge, with epidermis not peeling; prophylls of axillary buds small and subulate or well developed and foliaceous, with glands. Leaves 2- or 3-foliolate, biternately compound, or biternately pinnate, terminal leaflet or division often replaced by a simple (trifid) tendril, tendrils with adhesive disks, without uncinate apices; leaflets coriaceous

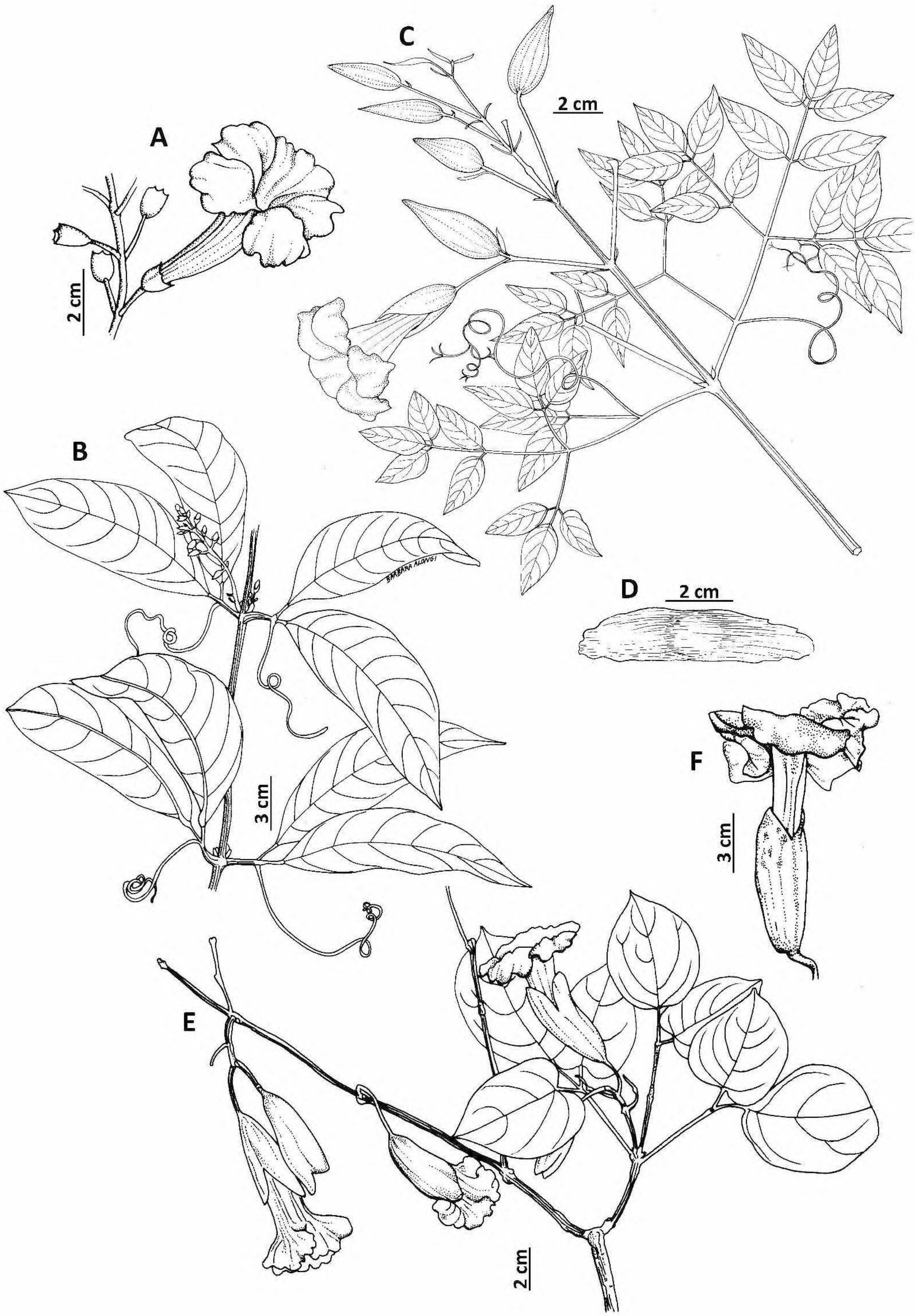


Figure 16. Representative morphological traits in *Mansoa* DC., *Neojobertia* Baill., and *Manaosella* J. C. Gomes. A, B. *Mansoa alliacea* (Lam.) A. H. Gentry. —A. Flower. —B. Flowering branch. C, D. *Neojobertia candolleana* (Mart. ex DC.) Bureau & K. Schum. —C. Flowering branch. —D. Seed. E, F. *Manaosella cordifolia* (DC.) A. H. Gentry. —E. Flowering branch. —F. Flower. A, B illustrated from *Vicentini et al. 672* (MO); C, D from *Gentry et al. 50136* (MO); E, F from *de Souza et al. 81* (MO).

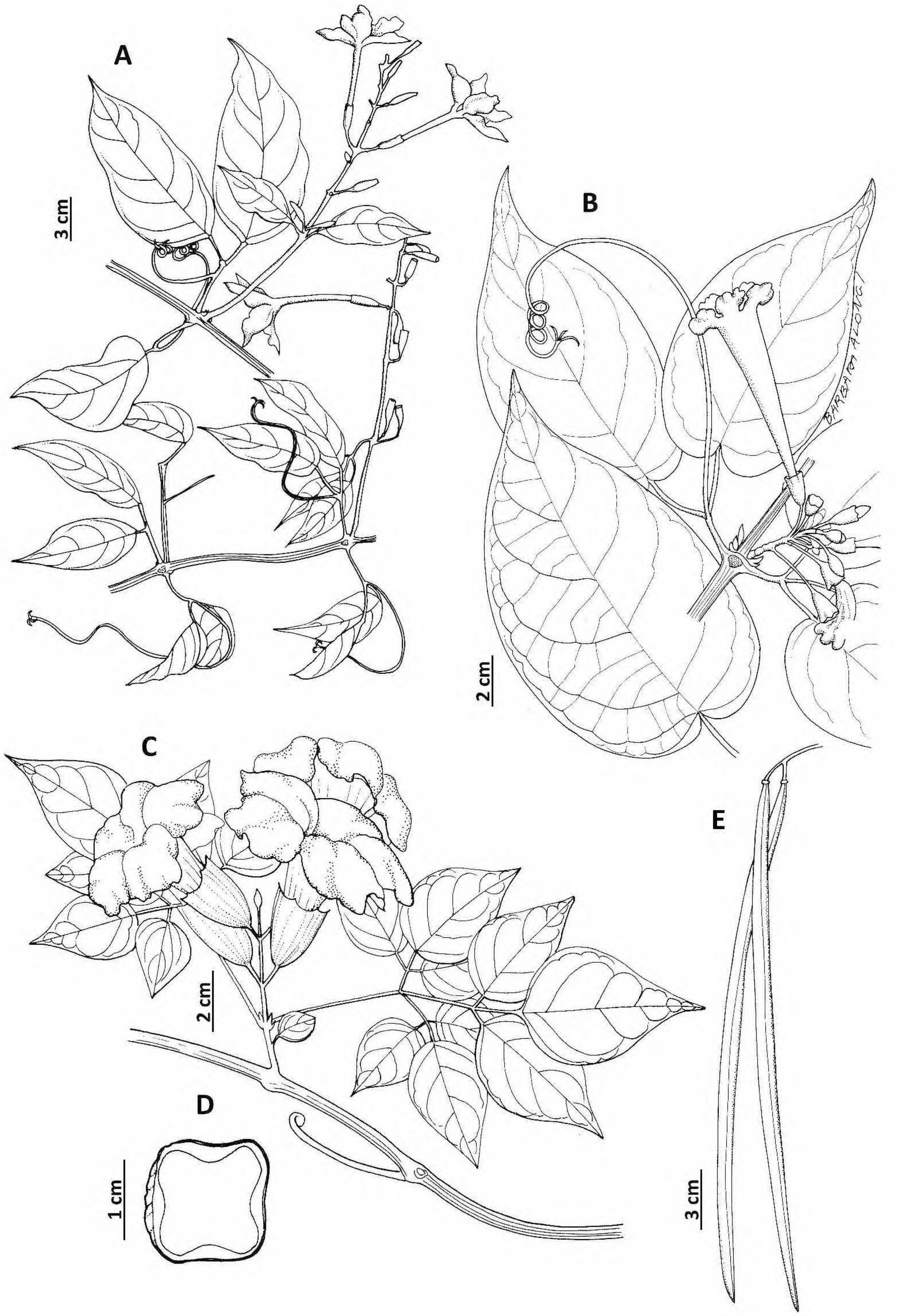


Figure 17. Representative morphological traits in *Pachyptera* DC. ex Meisn. and *Perianthomega* Bureau ex Baill. —A. *Pachyptera aromatica* (Barb. Rodr.) L. G. Lohmann, flowering branch. —B. *Pachyptera kerere* (Aubl.) Sandwith, flowering branch. C–E. *Perianthomega vellozoi* (Vell.) Bureau. —C. Flowering branch. —D. Cross-section of stem. —E. Fruit. A illustrated from *Lohmann et al. 28* (MO); B from *Weitzman & Hahn 287* (MO); C from *Coimbra 743* (MO); D from *Gentry et al. 73603* (MO); E from *Michel et al. 424* (MO).

(membranaceous), with (without) glands, without pellucid punctations, without domatia, petiolules articulated; petiole cylindrical, never modified into a tendril, articulated. Inflorescence axillary and/or terminal, a raceme (thyrse in *A. trichoclada*). Flowers zygomorphic, pentamerous; calyx cupular, shortly 5-lobed, 5-apiculate, or bilabiate, coriaceous, glabrous to villose externally, with volcano-shaped glands clustered near margins; corolla bright yellow (red, white), without nectar guides, infundibuliform (urceolate), straight in tube, membranaceous, puberulous (villose) externally, with glands on upper portion of tube, lobes 5, imbricate; stamens 4, with well-developed filaments, included (exserted), anthers glabrous, thecae straight, pollen in monads, inaperturate (colpate), with exine reticulate; ovary sessile, smooth and lepidote externally, ovules in 1 series on each placenta, stigma rhombic, glabrous; disk annular. Capsules linear or elliptic, flattened to inflated, straight, woody or coriaceous, with valves 2(4), glabrous to villose, without lenticels, with volcano-shaped glands, without wings, smooth or with midrib sometimes developed into a prominent ridge, with calyx caducous; seeds winged or corky and wingless, with seed body smooth and glabrous, wings linear, hyaline or opaque. Figure 5.

Nomenclatural note. The Martius material on which the name *Tecoma fulgens* Mart. is based is apparently a mixed collection of two species that are now called *Adenocalymma cymbalum* and *A. schomburgkii* (DC.) L. G. Lohmann. The application of the name *T. fulgens* has generally (e.g., Bureau & Schumann, 1896) followed the usage of de Candolle (1845), in which the name *T. fulgens* applies to the plants now called *A. cymbalum*, and the specimen of *T. fulgens* at G-DC (image!) clearly represents *A. cymbalum*. Further study of the Martius type material is needed, but for now the name *T. fulgens* is here considered a synonym of *A. cymbalum*.

Number of species, distribution, and habitat. *Adenocalymma* includes 82 species found in wet to dry forest, caatinga, and cerrado vegetation from Mexico and the Lesser Antilles to Paraguay and southeastern Brazil.

Memora, *Pleonotoma*, and *Pharseophora* were described by Miers (1863) based on species that all had biternately pinnate leaves, but differed in flower color. The affinities between *Memora* and *Adenocalymma* were noted by Bentham (1876), who put *Memora* in synonymy with *Adenocalymma*, but this classification was rejected by subsequent workers on Bignonieae. Even though Gentry and Tomb (1979: 766) noted the affinities between *Adenocalymma* and *Memora*, they maintained them as separate based on a distinction between the "usually pinnate" leaves of *Memora* and the 2- or 3-foliolate leaves of *Adenocalymma*. Gentry and Tomb noted (1979: 766) that "*Memora* could readily be merged with *Adenocalymma* if the not-always-constant definitive character of pinnately compound versus 3-foliolate or 2-foliolate leaves were neglected." Indeed, the biternately pinnate leaves of *Memora* (sometimes also called pinnate or 2- to 3-ternately compound) vary within some species, and even on an individual plant (e.g., *M. bracteosa*). The discovery of the species *M. tanaeciicarpa* A. H. Gentry, which is morphologically intermediate between the two genera, added to the confusion over delimitation of these genera. Gentry noted (1976: 58) about *M. tanaeciicarpa*: "This is quite unlike any other species of *Memora* in its large 4-valved capsule, its puberulous style and ovary, its yellowish-red puberulous 5-denticulate calyx, and its puberulous corolla tube. Except for the 2- or 3-ternately compound leaves it seems closer to *Adenocalymma comosum* and allies than to other *Memora* species, additional evidence of the artificiality of the separation of *Memora* and *Adenocalymma*."

Despite limited sampling of the *Memora–Sampaiella–Adenocalymma* clade for the molecular phylogeny (12 species out of 82), the current analysis suggests strongly that *Memora*, although monophyletic, is nested inside *Adenocalymma*. *Memora* and *Adenocalymma* share several distinctive features: stems with four phloem wedges in cross-section; strongly swollen, woody nodes; subwoody and strongly articulated petioles and petiolules; glandular, foliaceous prophylls; racemose inflorescences; yellow to red, pubescent corollas; ovules arranged in a single series on each placenta; inaperturate, reticulate pollen; and the unique volcano-shaped glands found on the calyx and fruit (Fig. 3). The affinities between *Adenocalymma* and *Sampaiella* are, however, less obvious and their close relationship has not been proposed on the basis of morphology alone. Previous studies considered *Sampaiella* closely related to *Arrabidaea* and *Cuspidaria* (e.g., Silva-Castro et al., 2004) based on the shared cymose inflorescences and colpate pollen, neither of which is found in *Adenocalymma* s. str. However, *Sampaiella* is well supported by molecular data as embedded within *Adenocalymma* (Lohmann, 2006) and also has volcano-shaped glands. Therefore *Adenocalymma* is here circumscribed to include *Memora* and *Samapiella*, and the volcano-shaped glands are a synapomorphy of this group. Most

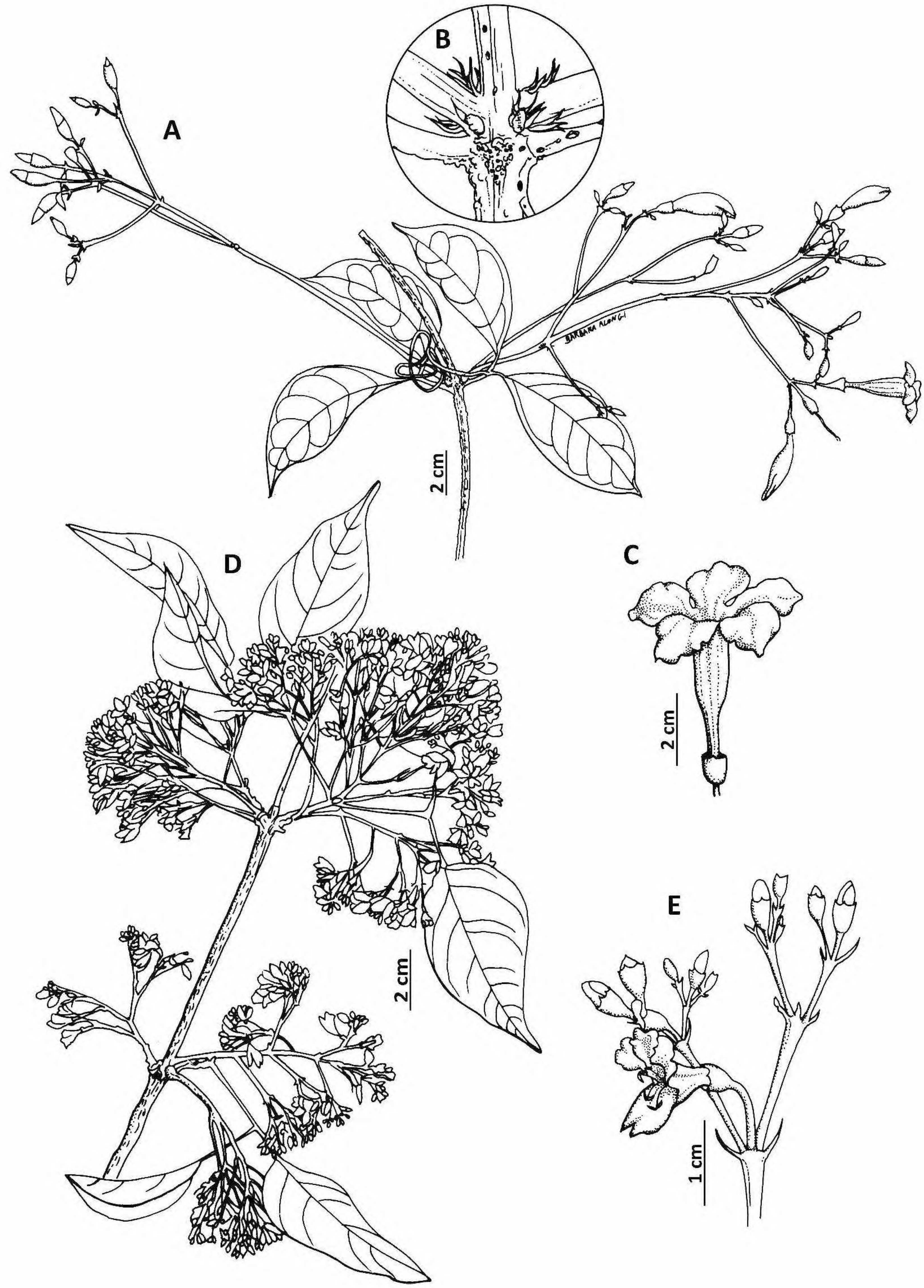


Figure 18. Representative morphological traits in *Tanaecium* Sw. and *Tynanthus* Miers. A–C. *Tanaecium truncatum* (A. Samp.) L. G. Lohmann. —A. Flowering branch. —B. Prophylls of axillary buds. —C. Flower. D, E. *Tynanthus panurensis* (Bureau) Sandwith. —D. Flowering branch. —E. Flower and flower buds. A–C illustrated from *Lohmann et al. 33* (MO); D, E from *Procópio et al. 14* (MO).

Adenocalymma species are pollinated by bees, a few by hummingbirds (Gentry, 1990).

As noted by Vizoni (2000), the spelling of the genus name *Adenocalymma* has varied. The name is a compound of two Greek words, "adenos," meaning "glands," and "kalymma," meaning "head covering." The spelling Adenocalymma has been conserved over Adenocalymna (McNeill et al., 2006).

1. Adenocalymma adenophorum (Sandwith) L. G. Lohmann, comb. nov. Basionym: *Memora adenophora* Sandwith, Kew Bull. 13: 435. 1958 [1959]. *Adenocalymma adenophorum* (Sandwith) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 758. 2010, nom. nud. invalid. TYPE: Brazil. Amazonas: Manaus, BR-17, Km. 11, 16 Apr. 1956, *J. Chagas 3734* (holotype, K!; isotype, INPA-3734!).

Habitat and distribution. This species is restricted to wet forest vegetation in the area of Manaus in north-central Brazil (Amazonas).

2. Adenocalymma album (Aubl.) L. G. Lohmann, comb. nov. Basionym: *Bignonia alba* Aubl., Hist. Pl. Guiane 2: 653, tab. 266. 1775. *Jacaranda alba* (Aubl.) Spreng., Syst. Veg. 2: 834. 1825. *Memora alba* (Aubl.) Miers, Proc. Roy. Soc. London 3: 185. 1863. TYPE: French Guiana. Rivière Sinnamary, 25 leagues above mouth, s.d., *J. B. C. F. Aublet s.n.* (holotype, BM!, BM as photocopy at MO-2300309!).

Habitat and distribution. This species is restricted to riverine habitats in French Guiana.

3. Adenocalymma allamandiflorum (Bureau ex K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Memora allamandiflora* Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 225. 1894. *Adenocalymma allamandiflorum* (Bureau ex K. Schum.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 758. 2010, nom. nud. invalid. TYPE: Brazil. Pará: Santarém, June 1850, *R. Spruce 715* (holotype, M-86272!, M as photo F neg. 20472 at MO-1692999!; isotypes, BM-551288!, NY-313129!, P [barcode] P00481558!).

Habitat and distribution. This species is found in humid forest vegetation in Brazil (Amapá, Maranhão, Minas Gerais, Pará).

4. Adenocalymma apparicianum J. C. Gomes, Arch. Jard. Bot. Rio de Janeiro 9: 223. 1949. TYPE: Brazil. Ceará: Rd. betw. Fortaleza & Crato, 2 Aug. 1948, *A. P. Duarte 1249* (holotype, RB-68294!; isotypes, HUEFS not seen, K!, SPF-193216!).

Habitat and distribution. This species is found in dry caatinga vegetation in northeastern Brazil (Ceará, Rio Grande do Norte).

5. Adenocalymma apurense (Kunth) Sandwith, Lilloa 3: 461. 1938. *Bignonia apurensis* Kunth, Nov. Gen. Sp. (quarto ed.) 3: 138. 1818 [1819]. TYPE: Venezuela. Apure: El Diamante, Apure River, s.d., *F. W. H. A. von Humboldt & A. J. A. Bonpland 812* (holotype, P-Bonpl.!, P-Bonpl. as photo F neg. 39410 at MO-1692916!; isotypes, B-W-11432!, K!).

Habitat and distribution. This species with water-dispersed seeds is found in humid lowland forest vegetation (Gentry, 1997) in Costa Rica, Panama, and Venezuela (Apure, Bolívar).

6. Adenocalymma arthropetiolatum A. H. Gentry, Ann. Missouri Bot. Gard. 60(3): 789, fig. 1E. 1973 [1974]. TYPE: Panama. Canal Zone [Colón]: Pipeline rd., 11 Nov. 1971, *A. H. Gentry 2460* (holotype, MO-2195517!; isotypes, F-2109794 image!, MO 2195518!).

Habitat and distribution. This species is restricted to wet forest vegetation in eastern Panama and Colombia (Antioquia, Chocó).

7. Adenocalymma aspericarpum (A. H. Gentry) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 270. 2008. *Memora aspericarpa* A. H. Gentry, Ann. Missouri Bot. Gard. 61(3): 55, fig. 3. 1976. TYPE: Venezuela. Yaracuy: betw. Aroa & Altamira, 1050 m, 22 Jan. 1972, *J. A. Steyermark 105375* (holotype, MO-2097929!; isotype, VEN not seen).

Habitat and distribution. This species is found in wet lowland and premontane vegetation in Colombia (Antioquia, Caldas, Córdoba, Cundinamarca, La Guajira, Magdalena), Venezuela (Aragua, Barinas, Bolívar, Lara, Mérida, Miranda, Portuguesa, Táchira, Yaracuy, Zulia), and perhaps Peru (Loreto).

8. Adenocalymma axillare (K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Memora axillaris* K. Schum., Pflanzenfam. 4(3b): 225. 1894. *Adenocalymma axillare* (K. Schum.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 758. 2010, nom. nud. invalid. TYPE: Brazil. Goiás: close to Trahiras, s.d., *J. E. Pohl 1882* (holotype, B†, B as photo F neg. 18442 at K! and at MO-1693000!;

lectotype, designated here, BR-876555!; isolectotypes, P [barcode] P00481557!, W [3]!).

Nomenclatural note. Two collections of this species were cited by Bureau and Schumann (1896), *Tamberlik s.n.* and Pohl's collection. The surviving specimen of these collections with the best material is here selected as the lectotype.

Habitat and distribution. This species is known from cerrado vegetation in Brazil (Goiás, Minas Gerais, Rondônia).

9. Adenocalymma bipinnatum (S. Moore) L. G. Lohmann, comb. nov. Basionym: *Macfadyena bipinnata* S. Moore, Trans. Linn. Soc. London, Bot. 4: 418. 1895. *Memora bipinnata* (S. Moore) A. H. Gentry, Ann. Missouri Bot. Gard. 63(1): 43. 1976. *Adenocalymma bipinnatum* (S. Moore) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 758. 2010, nom. nud. invalid. TYPE: Brazil. Mato Grosso: ad Santa Cruz, Sep. 1891–1892, *S. Moore 290* (holotype, BM-573951!, BM as photocopy at MO-2300310!; isotype, MO-2300310!).

Habitat and distribution. This species is found in cerrado vegetation in eastern Bolivia and in Brazil (Goiás, Maranhão, Mato Grosso, Pará, Rondônia).

10. Adenocalymma biternatum (A. Samp.) L. G. Lohmann, comb. nov. Basionym: *Memora biternata* A. Samp., Anais Reunião Sul-Amer. Bot. 3: 169. 1938 [1940]. *Adenocalymma biternatum* (A. Samp.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 758. 2010, nom. nud. invalid. TYPE: Brazil. Amazonas: Democracia, Madeira River, 30 Aug. 1923, *J. G. Kuhlmann 278* (holotype, RB-6464!; isotype, MO-2192034!).

Habitat and distribution. This species is found in forest vegetation in northern Bolivia and widely in Brazil (Amazonas, Rondônia, Mato Grosso, Pará).

11. Adenocalymma bracteatum (Cham.) DC., in A. DC., Prodr. 9: 200. 1845. *Bignonia bracteata* Cham., Linnaea 7: 692. 1832 [1833]. TYPE: Brazil. s. loc., s.d., *F. Sellow 1607* (holotype, LE not seen; isotypes, B†, B as photo F neg. 18459 at MO-1692798!, K!).

Habitat and distribution. This species is found in wet to dry forest vegetation in Peru (Huánuco, Madre de Dios), Bolivia, Paraguay, and Brazil (Acre, Bahia, Espírito Santo, Mato Grosso do Sul, Minas Gerais, Paraná, Rio de Janeiro, Rondônia, São Paulo).

12. Adenocalymma bracteolatum DC., in A. DC., Prodr. 9: 200. 1845. TYPE: Bolivia. Chiquitos: Sanctae Annae, 1850, *A. d'Orbigny 758* (lectotype, designated here, P [barcode] P00468570!; isolectotypes, BR-880300!, G-DC!, G-DC as photo F neg. 26187 at K!, G-DC as photocopy at MO-1692799!, MO-3401782!, P [barcode] P00468571!, P [barcode] P00468572!, P [barcode] P00468573!, and P specimens without barcodes as photocopies at MO-2294595!, MO-2294596!, MO-2294597!, and MO-2294598!).

Nomenclatural note. De Candolle specifically cited a P specimen in the protologue of this name. Several duplicates of the type collection are deposited at P and the best sheet is here chosen as a lectotype.

Habitat and distribution. This species is found in wet forest vegetation in Peru (Madre de Dios), Bolivia, and Brazil (Bahia, Mato Grosso do Sul, Minas Gerais, Paraná, Rio de Janeiro, Rondônia, São Paulo).

13. Adenocalymma bracteosum (DC.) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 270. 2008. *Spathodea bracteosa* DC., in A. DC., Prodr. 9: 208. 1845. *Pharseophora bracteosa* (DC.) Miers, Proc. Hort. Soc. London 3: 186. 1863. *Macfadyena bracteosa* (DC.) Benth., Gen. Pl. 2: 1035. 1876. *Memora bracteosa* (DC.) Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 226. 1894. TYPE: French Guiana. Cayenne, s.d., *Patris s.n.* (holotype, G-DC!, G-DC as photo F neg. 7691 at MO-1693058!).

Habitat and distribution. This species is found in evergreen lowland forest vegetation (Gentry, 1997) in Colombia (Amazonas, Chocó, Córdoba, Guainía), Venezuela (Amazonas, Apure, Barinas, Bolívar, Táchira), Guyana, Suriname, French Guiana, and Brazil (Amapá, Amazonas, Maranhão, Pará).

14. Adenocalymma bullatum Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 214. 1894. TYPE: Brazil. Rio de Janeiro: près de Rezende, São José Vaz, 27 Sep. 1874, *A. Glaziou 7771* (lectotype, designated here, P!, P as photocopy at MO-2294588!; isolectotypes, B†, B as photo F neg. 18460 at MO-1692800!, K!, P not seen, P as photocopy at MO-2294589!, P not seen, P as photocopy at MO-2294590!).

Nomenclatural note. There are three duplicates of the type collection in Paris, where Bureau's original material is deposited. One of these was annotated as the holotype by P staff, based on knowledge of Bureau's work methods and original

materials, and this designation was accepted by Gentry in sched. (MO). Two other P sheets were annotated and accepted by Gentry in sched. as isotypes. However, this designation has been questioned and thus, to prevent confusion, this name is here lecotypified and the specimen previously considered the holotype is here chosen as the lectotype.

Habitat and distribution. This species is known from wet forest vegetation in southeastern Brazil (Rio de Janeiro).

15. Adenocalymma calcareum Udulutsch & P. Dias, Nordic J. Bot. 27(6): 459, figs. 1, 2. 2009. TYPE: Brazil. Rondônia: Presidente Médice, BR-364 hwy., 6.5 km of rd. to Alvorada do Oeste, from Presidente Médice to Vilhena, rd. to Embratel's hill, then 14 km, 11°15′58.8″S, 61°52′11.7″W, 222 m, 17 Nov. 2005, *R. G. Udulutsch & P. Dias 2668* (holotype, HRCB not seen; isotypes, MG not seen, SPF-178000!).

Habitat and distribution. This species is known from secondary vegetation in southwestern Brazil (Rondônia).

16. Adenocalymma campicola (Pilg.) L. G. Lohmann, comb. nov. Basionym: *Memora campicola* Pilg., Bot. Jahrb. Syst. 30: 195. 1901. *Adenocalymma campicola* (Pilg.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 759. 2010, nom. nud. invalid. TYPE: Brazil. Mato Grosso: s. loc., s.d., *R. K. F Pilger 677* (holotype, B†); Minas Gerais: Uberlândia, Estação Ecológica do Panga, Aug. 1998, *L. G. Lohmann & P. E. Oliveira 266* (neotype, designated here, SPF-195919!; isoneotypes HUFU-24939!, MO-5832449!).

Nomenclatural note. The type specimen of *Memora campicola* was destroyed at B. No isotypes have been found, so a neotype that has both flowers and fruits is designated here.

Habitat and distribution. This species is found in dry forest and savanna vegetation in central Brazil (Amazonas, Bahia, Goiás, Mato Grosso, Minas Gerais).

17. Adenocalymma chocoense A. H. Gentry, Phytologia 57: 240. 1985. TYPE: Panama. Darién: Ensenada del Guayabo, 16–19 km SE of Jaqué, 29 Apr. 1980, *N. Garwood 972* (holotype, MO-2994466!; isotype, MO-29944671!).

Habitat and distribution. This species is known from lowland wet forest vegetation in eastern Panama and northwestern Colombia (Antioquia, Chocó; Gentry, 1985).

18. Adenocalymma cidii (A. H. Gentry ex Hauk) L. G. Lohmann, comb. nov. Basionym: *Memora cidii* A. H. Gentry ex Hauk, Novon 9: 48, fig. 1. 1999. *Adenocalymma cidii* (A. H. Gentry ex Hauk) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 759. 2010, nom. nud. invalid. TYPE: Brazil. Amazonas: Novo Aripuanã, BR 230, Rod. Transamazônica, 400 km N of Humaitá, 7°15′S, 60°00′W, 4 May 1985, *C. A. Cid Ferreira 6013* (holotype, MO-3506581!; isotypes, F-2047265 image!, NY image!).

Habitat and distribution. This species is known from wet forest vegetation in Amazonian Brazil (Amazonas) and Peru (Loreto).

19. Adenocalymma cladotrichum (Sandwith) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 270. 2008. *Memora cladotricha* Sandwith, Kew Bull. 8(4): 482. 1953 [1954]. TYPE: Colombia. Meta: Sierra de la Macarena, Río Guapaya, 500 m, 18 Jan. 1950, *W. R. Philipson, J. Idrobo & R. Jaramillo 2123* (holotype, BM!, BM as photo K neg. 856 at K!; isotype, US-2045137 image!).

Habitat and distribution. This species is known from evergreen forest vegetation (Gentry, 1997) in Colombia (Amazonas, Caquetá, Meta, Vaupés), Venezuela (Amazonas, Apure, Barinas, Bolívar, Carabobo, Falcón, Mérida, Miranda, Táchira, Trujillo, Yaracuy, Zulia), Ecuador, Peru (Amazonas, Huánuco, Loreto, San Martín, Ucayali), and Brazil (Acre).

20. Adenocalymma comosum (Cham.) DC., in A. DC., Prodr. 9: 201. 1845. *Bignonia comosa* Cham., Linnaea 7: 693. 1832 [1833]. TYPE: Brazil. s. loc., s.d., *F. Sellow s.n.* (holotype, LE not seen; isotypes, B†, B as photo F neg. 18461 at MO-1692901!, K!, K as photo K neg. 11555 at K!, K as photocopy at MO-2692315!, NY-313142!, RB-161655!, RB as photocopy at MO-230038!).

Habitat and distribution. This species is found in Atlantic forest vegetation in Brazil (Bahia, Espírito Santo, Minas Gerais, Paraná, Pernambuco, Rio de Janeiro, Santa Catarina, São Paulo).

21. Adenocalymma contractum (A. H. Gentry ex Hauk) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 270. 2008. *Memora contracta* A. H. Gentry ex Hauk, Novon 9(1): 50. 1999. TYPE: Brazil. Rondônia: SW Ariquemes, Mineiração

Mibrasa, Setor Alto Candeias, Km. 128, 10°35′S, 63°35′W, 16 May 1982, *L. O. A. Teixeira, A. J. Fife, K. McFarland, C. D. A. Mota, J. L. dos Santos, S. P. Gomes & B. W. Nelson 502* (holotype, MO-3237252!; isotypes, INPA-104239!, K!, NY-328885!, NY-328886!).

Habitat and distribution. This species is known from wet forest vegetation in Venezuela (Bolívar), Guyana, and Brazil (Amazonas, Pará, Rondônia).

22. Adenocalymma coriaceum A. DC., Prodr. 9: 202. 1845. TYPE: Brazil. Bahia: Bahia meridional, 1840, *J. S. Blanchet 3221* (holotype, G-DC!, G-DC as photo F neg. 7648 at MO-1692802!; isotypes, P [barcode] P00468574! P [barcode] P00468575!, P [barcode] P00468576!, P specimens without barcodes as photocopies at MO-2294486!, MO-2294487!, MO-2294601!).

Habitat and distribution. This species is known from Atlantic forest vegetation in eastern Brazil (Bahia, Espírito Santo).

23. Adenocalymma cristacalyx (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Memora cristacalyx* A. H. Gentry, Ann. Missouri Bot. Gard. 64(2): 316. 1977 [1978]. TYPE: Brazil. Ceará: s. loc., *F. F. Allemão & [init. unknown] Cisneiros 1045* (holotype, R-127332 not seen; isotype, MO-2305584!).

Habitat and distribution. This species is found in dry vegetation in northeastern Brazil (Ceará, Paraíba).

24. Adenocalymma croatii (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Memora croatii* A. H. Gentry, Ann. Missouri Bot. Gard. 61(3): 877. 1974. *Adenocalymma croatii* (A. H. Gentry) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 759. 2010, nom. nud. invalid. TYPE: Peru. Loreto: 7 km NE of Río Nanay & Puerto Almendra, 23 July 1972, *T. B. Croat 18335* (holotype, MO-2100198!; isotypes, F-1808202 image!, MO-2103338!, PMA not seen, USM not seen, VEN not seen).

Habitat and distribution. This species is known from wet forest vegetation in Colombia (Amazonas), Peru (Amazonas, Ucayali), and Brazil (Acre, Amazonas).

25. Adenocalymma cymbalum (Cham.) Bureau & K. Schum., Fl. Bras. 8(2): 112. 1896. *Bignonia cymbalum* Cham., Linnaea 7: 716. 1832 [1833]. TYPE: Brazil. s. loc, s.d., *F. Sellow 1613* (holotype, LE not seen; isotype, B†, B as photo F neg. 18482 at MO-1692883!).

Habitat and distribution. This species is known from humid forest vegetation in northern Brazil (Maranhão, Pará) and Atlantic forest vegetation in eastern and southeastern Brazil (Bahia, Espírito Santo, Minas Gerais, Rio de Janeiro).

26. Adenocalymma dichilum A. H. Gentry, Novon 3(2): 137. 1993. TYPE: Brazil. Piauí: betw. Bom Jesus & São Raimundo Nonato, 11 May 1979, *A. Fernandes s.n.* (holotype, EAC-6185!; isotype, MO-3204496!).

Habitat and distribution. This species is known from dry caatinga vegetation in northeastern and eastern Brazil (Bahia, Ceará, Piauí).

27. Adenocalymma divaricatum Miers, Ann. Mag. Nat. Hist., sér. 3, 7: 390. 1861. TYPE: Brazil. Bahia: Rio de Janeiro, ad montem Corcovado, *J. Miers 3383* (holotype, P [barcode] P00468577 image!).

Habitat and distribution. This species is known from dry caatinga vegetation and deciduous forests in Brazil (Bahia, Espírito Santo, Minas Gerais, Piauí, Rio de Janeiro).

28. Adenocalymma dugandii Sandwith, Kew Bull. 8(4): 479. 1953 [1954]. TYPE: Colombia. Cundinamarca: Hacienda El Cucharo, betw. Tocaima & Pubenza, 350 m, 7 May 1944, *E. P. Killip, A. Dugand & R. Jaramillo 38326* (holotype, K!; isotype, US-1856145 image!).

Habitat and distribution. This species is known from wet forest vegetation in central Colombia (Cundinamarca, Tolima).

29. Adenocalymma dusenii Kraenzl., Repert. Spec. Nov. Regni. Veg. 17: 115. 1921. TYPE: Brazil. Paraná: Itupava, 5 June 1909, *P. Dusén 8215* (holotype, S not seen, S as photocopy at MO-2909905!).

Habitat and distribution. This species is found in forest vegetation in southern Brazil (Paraná, Santa Catarina).

30. Adenocalymma flaviflorum (Miq.) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 270. 2008. *Spathodea flaviflora* Miq., Stirp. Surinam. Select. 124. 1850 [1851]. *Memora flaviflora* (Miq.) Pulle, Enum. Vasc. Pl. Surinam 427. 1906. TYPE: Suriname. s. loc., Aug. 1847,

A. Kappler 1865 (holotype, U not seen; isotype, P [barcode] P00481556!).

Habitat and distribution. This species is widely found in evergreen lowland forest vegetation (Gentry, 1997) in Colombia (Amazonas), Venezuela (Amazonas, Apure, Bolívar, Táchira), Guyana, Suriname, French Guiana, Peru (Loreto), and Brazil (Amazonas, Maranhão, Pará).

31. Adenocalymma flavum Mart. ex DC., in A. DC., Prodr. 9: 202. 1845. TYPE: Brazil. Bahia; Ilhéus, ad viam Felisberti, 1816, *Prince A. P. M. Wied-Neuwied in herb. Martius s.n.* (lectotype, designated here, BR-880369!; isolectotypes, BR- 880352!, BR-880385!, G-DC!).

Nomenclatural note. Part of Martius's herbarium has been transferred to BR, and therefore this represents original material. There are three duplicates of the type collection there and the best material is selected as the lectotype.

Habitat and distribution. This species is known from wet forest vegetation in eastern Brazil (Bahia, Espírito Santo).

32. Adenocalymma fruticosum A. H. Gentry, Novon 3(2): 137. 1993. TYPE: Brazil. Bahia: Serra do Sincorá, 6 km N of Cascavel on rd. to Mucugê, 1200 m, 13°06′S, 41°25′W, 25 Mar. 1980, *R. M. Harley, G. L. Bromley, A. M. de Carvalho & G. Martinelli 20943* (holotype, CEPEC not seen; isotypes, K!, MO-2918696!).

Habitat and distribution. This species is known from campo geral (i.e., grassland vegetation that is also rich in dicot herbs, shrubs, and acaulous palms) in the Serra do Sincorá in eastern Brazil (Bahia).

33. Adenocalymma gracielzae A. H. Gentry, Novon 3(2): 138. 1993. TYPE: Brazil. Pará: Senador José Porfirio, Rio Xingú, 3 Dec. 1991, *G. dos Santos, N. A. Rosa & M. R. dos Santos 276* (holotype, MG not seen; isotypes, MAD not seen, MO-4089769!).

Habitat and distribution. This species is known from restinga and riverside scrub vegetation along the River Xingú and its tributaries in northeastern Brazil (Pará; Gentry, 1993).

34. Adenocalymma grandifolium Mart. ex DC., in A. DC., Prodr. 9: 199. 1845. *Bignonia grandifolia* Vell., Fl. Flumin. 247. 1825 [1829], Fl. Flum. Icon. 6: tab. 28. 1827 [1831], hom. illeg., non *Bignonia grandifolia* Jacq., 1798. *Adenocalymma prasinum* Miers, Ann. Mag. Nat. Hist., Ser. 3, 7: 395. 1861, nom. superfl. TYPE: tab. 28 in Vellozo, Fl. Flumin. Icon. 6, 1827 [1831] (lectotype, designated by Laroche [1973: 6]).

Nomenclatural note. De Candolle's name was based on Vellozo's species *Bignonia grandifolia*, and thus must be typified by Vellozo's materials. However, Vellozo's name was an illegitimate later homonym and thus cannot be a basionym for a nomenclatural combination, so de Candolle's name is effectively a replacement name. Miers's name *Adenocalymma prasinum* was an avowed substitute for *A. grandifolium*, but it was not needed because de Candolle's earlier name was available and thus is superfluous.

Habitat and distribution. This species is found in wet vegetation in southeastern Brazil (Rio de Janeiro).

35. Adenocalymma hatschbachii A. H. Gentry, Novon 3(2): 139. 1993. TYPE: Brazil. Paraná: Morro do Arrastão, Mun. Morretes, 200 m, 18 July 1981, *G. Hatschbach 43956* (holotype, MO-2925256!; isotype, MBM not seen).

Habitat and distribution. This species is known from wet subtropical forest vegetation in southeastern Brazil, near sea level from Paraná to southern São Paulo State and to higher elevations in Rio de Janeiro State (Gentry, 1993).

36. Adenocalymma heterophyllum Kraenzl., Notizbl. Königl. Bot. Gart. Berlin 6: 372. 1915. *Memora heterophylla* (Kraenzl.) Sandwith, Receuil Trav. Bot. Néerl. 34: 214. 1937. TYPE: Brazil. Acre: Rio Branco, Jan. 1909, *E. Ule 7849* (holotype, B†; lectotype, designated here, K [barcode] K000449764!; isolectotype, MG-12942 not seen, MG-12942 as photocopy at MO-2300101!).

Habitat and distribution. This species is known from riparian lowland vegetation (Gentry, 1997) in Venezuela (Amazonas), Guyana, and Brazil (Amazonas, Pará, Roraima).

37. Adenocalymma hirtum (Mart. ex DC.) Bureau & K. Schum., Fl. Bras. 8(2): 100. 1896. *Tecoma hirta* Mart. ex DC., in A. DC., Prodr. 9: 222. 1845. TYPE: Brazil. Rio de Janeiro, Dec., *C. F. P. von Martius s.n.* (holotype, M-86330!, M as photo F neg. 20447 at MO-1692808!; isotype, G-DC!).

Habitat and distribution. This species is known from Atlantic forest vegetation in eastern Brazil (Bahia, Espírito Santo, São Paulo).

38. Adenocalymma hypostictum Bureau & K. Schum., Fl. Bras. 8(2): 99. 1896. TYPE: Brazil. Minas Gerais: s. loc., s.d., *A. Glaziou 15257* (holotype, P not seen, P as photocopy at MO-2294482!; isotype, B†, B as photo F neg. 18464 at MO-1692809!).

Habitat and distribution. This species is known from Atlantic forest vegetation in eastern Brazil (Bahia, Espírito Santo, Pernambuco, Rio de Janeiro).

39. Adenocalymma imperatoris-maximilianii (Wawra) L. G. Lohmann, comb. nov. Basionym: *Bignonia imperatoris-maximilianii* Wawra, Bot. Ergebn. 73, tab. 10. 1866. *Pleonotoma imperatoris-maximilianii* (Wawra) Bureau & K. Schum., Fl. Bras. 8(2): 279. 1896 [1897]. *Memora imperatoris-maximilianii* (Wawra) A. H. Gentry, Ann. Missouri Bot. Gard. 64(2): 316. 1977 [1978]. *Adenocalymma imperatoris-maximilianii* (Wawra) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 759. 2010, nom. nud. invalid. TYPE: Brazil. Bahia: Itapema, s.d., *H. Wawra & F. Maly 156* (holotype, W!, W as photo F neg. 32874 at MO-1693043!).

Habitat and distribution. This species is known from seasonal vegetation in northeastern and eastern Brazil (Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí).

40. Adenocalymma impressum (Rusby) Sandwith, Recueil Trav. Bot. Néerl. 34: 212. 1937. *Bignonia impressa* Rusby, Mem. Torrey Bot. Club 6: 100. 1896 [1897]. TYPE: Bolivia. La Paz: Guanai-Tipuni, Apr.–June 1892, *A. M. Bang 1321* (lectotype, designated here, NY-579086!; isolectotypes, F-160450 image!, G-8979!, G-14106!, G-14107!, K!, M-86329!, MO-2005552!, NY-579085!, US-47712 image!, US-1322433 image!).

Nomenclatural note. Two duplicates of the type collection were located at NY. One has the original handwritten label and a well-preserved flower, while the other has a printed label as well as part of a page from the publication of this species name mounted on it and was previously deposited in the Columbia College herbarium where Rusby worked. The specimen with the handwritten label and better flowers is chosen as the lectotype.

Habitat and distribution. This species is known from humid to dry lowland forest vegetation in Colombia (Amazonas), Venezuela (Amazonas, Apure, Bolívar), French Guiana, Ecuador, Peru (Huánuco, Loreto, Madre de Dios, Pasco, Ucayali), Bolivia, and Brazil (Acre, Amazonas, Pará).

41. Adenocalymma inundatum Mart. ex DC., in A. DC., Prodr. 9: 201. 1845. TYPE: Brazil. Pará: island of Marajó, Aug. 1819, *C. F. P. von Martius s.n.* (lectotype, designated here, M-86326!, M as photo F neg. 20448 at MO-1692810!; isolectotypes, M-86327!, M-86328!).

Nomenclatural note. Three duplicates of this type were deposited at M and the single flowering specimen is here selected as the lectotype.

Habitat and distribution. This species is found in humid lowland forest vegetation in Mexico (Campeche, Chiapas, Guerrero, Jalisco, México, Michoacán, Nayarit, Oaxaca, Puebla, Sinaloa, Tabasco, Veracruz), the Lesser Antilles (Grenada, St. Lucia, St. Vincent), Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Atlántico, Bolívar, Magdalena, Santander, Sucre), Venezuela (Bolívar, Lara, Nueva Esparta, Sucre, Táchira, Trujillo, Zulia), Guyana, French Guiana, Ecuador, Peru (Loreto, Madre de Dios), and Brazil (Amapá, Amazonas, Maranhão, Pará, Roraima).

42. Adenocalymma involucratum (Bureau & K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Memora involucrata* Bureau & K. Schum., Fl. Bras. 8(2): 271. 1896 [1897]. *Pharseophora involucrata* Miers, Proc. Roy. Hort. Soc. London 3: 186. 1863, nom. nud. *Adenocalymma involucratum* (Bureau & K. Schum.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 759. 2010, nom. nud. invalid. TYPE: Brazil. Piauí: Oieiras, Mar. 1839, *G. Gardner 2241* (holotype, P [barcode] P00481552!; isotypes, BM-571229!, F-1012428 image!, K!, NY-328898!).

Habitat and distribution. This species is found in dry caatinga vegetation in eastern Brazil (Bahia, Ceará, Goiás, Maranhão, Minas Gerais, Piauí, Tocantins).

43. Adenocalymma juliae (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Memora juliae* A. H. Gentry, Ann. Missouri Bot. Gard. 68(1): 118. 1981. *Adenocalymma juliae* (A. H. Gentry) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 759. 2010, nom. nud. invalid. TYPE: Peru. Loreto: Maynas, Río Yaguasyacu, tributary of Río Amapiyacu, below Borro Indian village of Villa Nueva, 7 Nov. 1977, *A. H. Gentry & J. Revilla 20348* (holotype, MO-2658634!; isotypes,

AMAZ not seen, F-1844726 image!, GH not seen, NY-73993!, USM not seen).

Habitat and distribution. This species is found in seasonally flooded forest vegetation in Amazonian Peru (Loreto) and Brazil (Amazonas, Pará).

44. Adenocalymma longilineum (A. Samp.) L. G. Lohmann, comb. nov. Basionym: *Memora longilinea* A. Samp., Bol. Mus. Nac. Rio de Janeiro 12(3, 4): 85. 1936. *Adenocalymma longilineum* (A. Samp.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 759. 2010, nom. nud. invalid. TYPE: Brazil. Amazonas: Manaus, estrada do Aleixo, 14 June 1933, *A. Ducke 1934* (holotype, RB-24097 [barcode] RB00659635!; isotypes, RB-24097 [barcode] RB00536903!, RB-24097 [barcode] RB00659596!, K!).

Habitat and distribution. This species is found in wet lowland forest vegetation in Amazonian Bolivia and Brazil (Acre, Amazonas, Pará, Rondônia).

45. Adenocalymma magdalenense Dugand, Caldasia 4: 61. 1946. TYPE: Colombia. Magdalena: Aracataca, hacienda Macaraquilla, 30 m, 20 Jan. 1940, *A. Dugand & H. Garcia-Barriga 2480* (holotype, COL-23167 not seen).

Habitat and distribution. This species is found in wet lowland forest vegetation in the lower Magdalena River valley in northern Colombia (Bolívar, Magdalena).

46. Adenocalymma magnificum Mart. ex DC., in A. DC., Prodr. 9: 202. 1845. *Memora magnifica* (Mart. ex DC.) Bureau, in Warm., Kongel. Danske Vidensk. Selsk. Skr., Naturvifrsnk. Math. Afh. 1893: 106. 1893 [1894]. TYPE: Brazil. Pará: near Canumã & Rio Amazonas, Apr. 1820, *C. F. P. von Martius 2592* (lectotype, designated here, M-86283!, M as photo F neg. 20487 at MO-1693008!, M as photo K neg. 5941 at K!; isolectotypes, K!, M-86282!, M-86262 as photo K neg. 5939 at K!, M-86284!, M-86284 as photo K neg. 5940 at K!, M-86285!, M-86286!, M-86286 as photo K neg. 5943 at K!, M-86287!).

Nomenclatural note. Original material of this species appears to be at M, and the best sheet deposited there is selected as the lectotype.

Habitat and distribution. This species is found in wet lowland forest vegetation in Amazonian Brazil (Amazonas, Maranhão, Pará, Roraima).

47. Adenocalymma magnoalatum Scud., Novon 10(3): 234, fig. 1. 2000. TYPE: Brazil. Minas Gerais: Marliéria, Parque Estadual do Rio Doce, 10 Oct. 1996, *V. V. Scudeller 579* (holotype, VIC!; isotype, MO not seen).

Habitat and distribution. This species is known from only a few collections in Atlantic forest vegetation in eastern Brazil (Minas Gerais).

48. Adenocalymma marginatum (Cham.) DC., in A. DC., Prodr. 9: 200. 1845. *Bignonia marginata* Cham., Linnaea 7: 695. 1832 [1833]. TYPE: Brazil. Santa Catarina: s. loc., s.d., *F. Sellow 5581* (holotype, LE not seen).

Nomenclatural note. Sandwith and Hunt (1974) discussed the typification of this name and concluded that the protologue cited two specimens: a Chamisso collection from Fretum Sanctae Catharinae, today's Florianópolis, and a Sellow collection from Misitque. However, Chamisso did not visit Brazil, and the full information given in the protologue about the Sellow collection was Misitque e Brasilia Sellowius, which means sent from Brazil by Sellow. Thus only one Sellow collection was cited for this species, which is here considered the type. A photo of a Sellow specimen deposited at B was distributed as a photo of the type of this name (photo F neg. 18465 at MO-1692814!), but this specimen has since been destroyed. The specimen in the photo has the name *Bignonia marginata* and an identification of Sellow as the collector in one handwriting on one label, with no collection number noted here, and an annotation of the number 5581 and the locality São Paulo written in another handwriting on an additional label that is glued onto the first label. Thus this specimen does not appear to have been a type.

Habitat and distribution. This species is found in dry forest vegetation in Paraguay, Brazil (Alagoas, Bahia, Espírito Santo, Mato Grosso do Sul, Minas Gerais, Paraná, Rio de Janeiro, Santa Catarina, São Paulo), Uruguay, and Argentina (Corrientes, Entre Ríos, Misiones).

49. Adenocalymma molle (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Memora mollis* A. H. Gentry, Phytologia 46(4): 211. 1980. *Adenocalymma molle* (A. H. Gentry) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 759. 2010, nom. nud. invalid. TYPE: Brazil. Amazonas: Manaus–Caracaraí Hwy., 3 km W of Reserva Experimental Station of INPA, Km. 60, 15 Aug. 1974, *G. T. Prance, T. D. Pennington, B. W. Nelson & J. F. Ramos 21658* (holotype, INPA

not seen; isotypes, MG not seen, MO-2236218!, NY-232334!).

Habitat and distribution. This species is known from wet lowland forest vegetation in Amazonian Brazil (Amazonas, Pará).

50. Adenocalymma moringifolium (DC.) L. G. Lohmann, comb. nov. Basionym: *Bignonia moringifolia* DC., in A. DC., Prodr. 9: 170. 1845, as "moringaefolia." *Pleonotoma moringifolia* (DC.) Miers, Proc. Roy. Hort. Soc. London 3: 184. 1863. *Memora moringifolia* (DC.) Sandwith, Receuil Trav. Bot. Néerl. 34: 207. 1937. *Adenocalymma moringifolium* (DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 759. 2010, nom. nud. invalid. TYPE: French Guiana. Cayenne, s.d., *Anonymous s.n.* (holotype, P [barcode] P00410843!, P as photocopy at MO-2904517!, P as photo F neg. 39935 at K!).

Habitat and distribution. This species is found in wet forest vegetation in Suriname, French Guiana, and Brazil (Amazonas, Pará).

51. Adenocalymma nervosum Bureau & K. Schum., Fl. Bras. 8(2): 95. 1896. TYPE: Brazil. Minas Gerais: s. loc., s.d., *G. Schüch s.n.* (lectotype, designated here, W!, W as photo F neg. 32841 at K!, W as photo F neg. 32841 at MO-1692823!; isolectotype, P, not seen, P as photocopy at MO-2927301!).

Nomenclatural note. Two syntypes from Minas Gerais, *Schüch s.n.* and *Ackermann s.n.*, were cited in the protologue. The Schüch collection was seen in W, and the Ackermann collection in BR. The Schüch collection is more complete and in better condition, and photographs of this but not the Ackermann collection were distributed in the F negative series and are widely available. Therefore, the Schüch collection at W is here designated as the lectotype.

Habitat and distribution. This species is known only from forest vegetation in southeastern Brazil (Minas Gerais).

52. Adenocalymma nodosum (Silva Manso) L. G. Lohmann, comb. nov. Basionym: *Bignonia nodosa* Silva Manso, Enum. Subst. Braz. 40. 1836. *Memora nodosa* (Silva Manso) Miers, Proc. Roy. Hort. Soc. London 3: 185. 1863. *Adenocalymma nodosum* (Silva Manso) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 760. 2010, nom. nud. invalid. TYPE: Brazil. Mato Grosso: Cuiabá, s. loc., s.d., *A. Silva Manso s.n.* (holotype, not located).

Nomenclatural note. Type materials have not been located so far, so further studies are necessary to clarify the typification of this species.

Habitat and distribution. This species is known from cerrado vegetation in central and southeastern Brazil (Goiás, Mato Grosso, Minas Gerais, Piauí, Rio de Janeiro, Tocantins).

53. Adenocalymma patulum (Miers) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 270. 2008. *Memora patula* Miers, Proc. Roy. Hort. Soc. London 4: 161. 1864. TYPE: Colombia. Magdalena: Río Magdalena, July 1868, *M. Weir 35* (holotype, K!).

Habitat and distribution. This species is known from semideciduous lowland forest vegetation (Gentry, 1997) in Colombia (Antioquia, Atlántico, Bolívar, Cundinamarca, La Guajira, Magdalena, Sucre), Venezuela (Amazonas, Anzoátegui, Apure, Aragua, Bolívar, Carabobo, Cojedes, Falcón, Guárico, Lara, Miranda, Monagas, Sucre, Zulia), and possibly Peru (San Martín).

54. Adenocalymma paucifoliolatum (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Memora paucifoliolata* A. H. Gentry, Ann. Missouri Bot. Gard. 61(3): 878. 1974. *Adenocalymma paucifoliolatum* (A. H. Gentry) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 760. 2010, nom. nud. invalid. TYPE: Brazil. Goiás: 10 km W of Cristalina, 1200 m, 4 Mar. 1966, *H. S. Irwin, J. R. Grear, Jr., R. Souza & R. Reis dos Santos 13438* (holotype, UB not seen; isotypes, K!, MO-2092446!).

Habitat and distribution. This species is found in cerrado vegetation in central to southeastern Brazil (Bahia, Goiás, Minas Gerais, Tocantins, Pará).

55. Adenocalymma paulistarum Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 214. 1894. TYPE: Brazil. São Paulo: prope Campinas, *J. Correia de Méllo 28* (lectotype, designated here, S04-3475 image!; isolectotypes, K [barcode] K000449348 image!, K [barcode] K000449349 image!, US-01706100 image!).

Nomenclatural note. No specimens were cited in the protologue of this species, which was very synoptic, but three specimens were cited by Bureau and Schumann (1896). These were a Sellow specimen without collection number or locality data; the collection *A. F. Regnell III-902*, from Caldas in Minas Gerais; and the collection *Correia de Méllo 28* from Campinas in São Paulo. Any duplicates of these

specimens that were deposited at B are now lost. Sellow material corresponding to this species has not been located. There is a duplicate of the Regnell collection at BR (BR-880349!), which has only a few flowers that have been damaged by insects. There are several duplicates of the Correia de Méllo collection that have good flowers in good condition, and this is chosen here as the type. No duplicates of this collection were found at P, but there are two specimens at K, one with a small inflorescence with an immature fruit and several young flower buds, and a second one with a sterile branch and three loose flowers in the packet, as well as specimens at S and US that have good leaves and a fully developed inflorescence with multiple mature flowers. The exemplary specimen at S is here chosen as the lectotype.

Habitat and distribution. This species is only known from wet forest vegetation in southeastern Brazil (São Paulo) and Argentina (Misiones).

56. Adenocalymma pedunculatum (Vell.) L. G. Lohmann, comb. nov. Basionym: *Bignonia pedunculata* Vell., Fl. Flumin. 250. 1825 [1829]; Fl. Flumin. Icon. 6: tab. 41. 1827 [1831]. *Memora pedunculata* (Vell.) Miers, Proc. Roy. Hort. Soc. London 3: 185. 1863. *Adenocalymma pedunculatum* (Vell.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 760. 2010, nom. nud. invalid. TYPE: tab. 41 in Vellozo, Fl. Flumin. Icon. 6, 1827 [1831] (lectotype, designated here).

Habitat and distribution. This species is found in forest and cerrado vegetation in Brazil (Bahia, Distrito Federal, Goiás, Maranhão, Mato Grosso, Minas Gerais, Pará, São Paulo, Tocantins).

57. Adenocalymma peregrinum (Miers) L. G. Lohmann, comb. nov. Basionym: *Pleonotoma peregrina* Miers, Proc. Roy. Hort. Soc. London 3: 183. 1863. *Memora peregrina* (Miers) Sandwith, Kew Bull. 8(4): 483. 1953 [1954]. *Adenocalymma peregrinum* (Miers) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1582. 2008, nom. nud. invalid. *Adenocalymma peregrinum* (Miers) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 760. 2010, nom. nud. invalid. TYPE: Brazil. São Paulo: s. loc., 1861–1862, *M. Weir 152* (holotype, K!; isotype, BM!).

Habitat and distribution. This species is found in cerrado vegetation in Brazil (Espírito Santo, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraná, São Paulo) and Paraguay.

58. Adenocalymma prancei A. H. Gentry, Ann. Missouri Bot. Gard. 65(2): 725. 1978 [1979]. TYPE: Brazil. Amazonas: 3–6 km N of Manaus–Itacoatiara Rd., near Rio Preto da Eva (Km. 79), 3 Dec. 1974, *A. H. Gentry & J. Ramos 13063* (holotype, INPA not seen; isotypes, MG not seen, MO-2257039!).

Habitat and distribution. This species is found in wet lowland forest vegetation in French Guiana and Amazonian Brazil (Amazonas, Pará).

59. Adenocalymma pseudopatulum (A. H. Gentry) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 280. 2008. *Memora pseudopatula* A. H. Gentry, Ann. Missouri Bot. Gard. 68(1): 119. 1981. TYPE: Peru. Loreto: Río Mazán, just above La Libertad, ca. 35 km above Mazán, ca. 150 m, 10 July 1976, *A. H. Gentry & J. Revilla 16617* (holotype, MO-2690665!; isotypes, AMAZ not seen, COL not seen, F-1855573 image!, INPA not seen, MO-2690654!, US-2892289 image!, USM not seen).

Habitat and distribution. This species is found in seasonally flooded forest vegetation (Gentry, 1997) in Colombia (Amazonas), Venezuela (Amazonas), Peru (Amazonas), and Brazil (Acre).

60. Adenocalymma pubescens (Spreng.) L. G. Lohmann, comb. nov. Basionym: *Amphilophium pubescens* Spreng., Syst. Veg. 2: 836. 1825. *Bignonia fallax* Cham., Linnaea 7: 717. 1832 [1833], replacement name, non *Bignonia pubescens* L., 1763. *Pharseophora fallax* (Cham.) Miers, Proc. Roy. Hort. Soc. London 3: 185. 1863, nom. illeg. *Memora fallax* (Cham.) Bureau, in Warm., Kongel. Danske Vidensk. Selsk. Skr., Naturvidensk. Math. Afh. 1893: 105 1893, nom. illeg. *Memora pubescens* (Spreng.) K. Schum., Nat. Pflanzenfam. 4(3b): 226. 1894. *Macfadyena fallax* (Cham.) S. Moore, Trans. Linn. Soc. London, Bot. 4: 418. 1895, non *Macfadyena pubescens* S. Moore, 1895. *Adenocalymma pubescens* (Spreng.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 760. 2010, nom. nud. invalid. TYPE: Brazil. S. loc., s.d., *F. Sellow s.n.* (holotype, B†; lectotype, designated here, K!).

Nomenclatural note. Miers's name *Pharseophora fallax* is illegitimate because the earlier epithet "pubescens" was available in *Pharseophora*, and correctly should have been used. The name *Memora fallax* is similarly illegitimate because the epithet "pubescens" was available in *Memora* and correctly should have been used instead of "fallax." However,

the name *Macfadyena fallax* is legitimate because the epithet pubescens was previously used in that genus for a different species and thus was not available for this species. Only one isotype was found and is designated as the lectotype here.

Habitat and distribution. This species is found in dry vegetation in central Brazil (Ceará, Goiás, Maranhão, Pernambuco, Piauí, Tocantins) and Atlantic forest vegetation in eastern Brazil (Bahia, Espírito Santo, Minas Gerais, São Paulo).

61. Adenocalymma purpurascens Rusby, Descr. S. Amer. Pl. 121. 1920. TYPE: Venezuela. Lower Orinoco, 1896, *H. H. Rusby & R. W. Squires s.n.* (holotype, NY-313044!, NY as photo K neg. 3388 at K!).

Habitat and distribution. This species is widespread in evergreen forest vegetation (Gentry, 1997) in Colombia (Amazonas, Meta), Venezuela (Amazonas, Bolívar, Delta Amacuro), Guyana, Suriname, French Guiana, Ecuador, Peru (Huáncuo, Junín, Loreto, Madre de Dios, Pasco, Puno, San Martín), Bolivia, and Brazil (Amazonas, Maranhão, Mato Grosso, Pará, Rôndonia).

62. Adenocalymma racemosum (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Memora racemosa* A. H. Gentry, Ann. Missouri Bot. Gard. 65(2): 731. 1978 [1979]. *Adenocalymma racemosum* (A. H. Gentry) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 760. 2010, nom. nud. invalid. TYPE: Brazil. Pará: Km. 93 of Belém–Brasília Hwy., 5 Aug. 1963, *B. Maguire, J. Murça Pires, C. K. Maguire & N. T. Silva 56008* (holotype, MO-2232814!; isotypes, COL-114245 image!, F-1812279 image!, MO-2279292!, NY [barcode] NY00328889!, NY [barcode] NY00328890!).

Habitat and distribution. This species is found in wet forest vegetation in Guyana, Suriname, French Guiana, and Brazil (Amapá, Amazonas, Maranhão, Mato Grosso, Pará).

63. Adenocalymma reticulatum Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 214. 1894. TYPE: Brazil. Minas Gerais: s. loc., s.d., *C. F. P. von Martius s.n.* (holotype, BR-880382!, BR as photo K neg. 2046 at K!, BR as photo K neg. 2046 at MO-3694056!).

Habitat and distribution. This species is found in Atlantic forest vegetation in eastern Brazil (Bahia, Minas Gerais, Rio de Janeiro).

64. Adenocalymma salmoneum J. C. Gomes, Dusenia 2: 314, tab. 4, figs. 1–6. 1951. TYPE: Brazil. Espírito Santo: N of Rio Doce, margin of River São Gabriel, Sep. 1950, *J. N. Vieira 20* (holotype, RB-71152!; isotype, MBML not seen).

Habitat and distribution. This species is restricted to wet forest vegetation in eastern Brazil (Espírito Santo, Minas Gerais).

65. Adenocalymma salzmanii DC., in A. DC., Prodr. 9: 200. 1845. TYPE: Brazil. Bahia: s. loc., s.d., *P. Salzmann 341* (holotype, G-DC not seen, G-DC as photo F neg. 7647 at MO-1692816!).

Habitat and distribution. This species is restricted to dry forest vegetation in eastern Brazil (Bahia).

66. Adenocalymma sastrei (A. H. Gentry ex Hauk) L. G. Lohmann, comb. nov. Basionym: *Memora sastrei* A. H. Gentry ex Hauk, Novon 9(1): 52. 1999. Colombia. Amazonas: Río Igará-Paraná, La Chorrera, 22 Sep. 1973, *C. Sastre 2293* (holotype, MO-2637040!; isotype, P!, P as photocopy at MO-05060095!).

Habitat and distribution. This species is known only from the type locality in southern Colombia (Amazonas).

67. Adenocalymma saulense A. H. Gentry, Novon 3(2): 140. 1993. TYPE: French Guiana. Saül: La Fume Mountain Trail, 3°37′N, 53°12′W, 250–350 m, 27 Aug. 1988, *S. A. Mori, C. Gracie, L. Flynn, W. Pagels, C. James, W. Capraro, L. Connick, P. O'Malley, D. Vuillequez & H. Betros 19192* (holotype, MO-3600685!; isotypes, CAY!, NY [barcode] NY00039315!).

Habitat and distribution. This species is known only from the Saül area of southern French Guiana, where it occurs in well-drained, moist forests on lateritic soils (Gentry, 1993).

68. Adenocalymma scabriusculum Mart. ex DC., in A. DC., Prodr. 9: 201. 1845. TYPE: Brazil. Piauí: betw. Oeiras & Olho D'água, May 1817, *C. F. P. von Martius 2900* (lectotype, designated here, M-86322!, M as photo F neg. 20451 at MO-1692817!, M as photo K neg. 5956 at K!; isolectotype, M-86323!, M as photo K neg. 5955 at K!).

Nomenclatural note. Original type material of this name is at M. Two duplicates are deposited there and the best material is selected here as the lectotype.

Habitat and distribution. This species is found in dry caatinga vegetation in central Brazil (Goiás, Maranhão, Piauí, Tocantins).

69. Adenocalymma scansile Miers, Ann. Mag. Nat. Hist., ser. 3, 7: 388. 1861. TYPE: Brazil. Rio de Janeiro (not located).

Nomenclatural note. The type of this name was not detailed in the protologue and has not yet been identified or located. More study is needed before its typification can be clarified.

Habitat and distribution. This species is found in tropical and subtropical forest vegetation in Paraguay, Brazil (Minas Gerais, Paraná, Rio de Janeiro, São Paulo, Santa Catarina), and Argentina (Misiones).

70. Adenocalymma schomburgkii (DC.) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 270. 2008. *Spathodea schomburgkii* DC., in A. DC., Prodr. 9: 207. 1845. *Memora schomburgkii* (DC.) Miers, Proc. Roy. Hort. Soc. London 3: 185. 1863. TYPE: British Guiana [Guyana]. s. loc., 1837, *Rob. Schomburgk ser. I, 365* (holotype, G-DC!, G-DC as photo F neg. 7693 at MO-1693061!; isotypes, BM!, K!).

Habitat and distribution. This species is found in seasonally inundated lowland forest vegetation (Gentry, 1997) in Colombia (Amazonas, Caquetá, Guainía, Vaupes), Venezuela (Amazonas, Bolívar), Guyana, Suriname, French Guiana, Ecuador, Peru (Loreto), and Brazil (Acre, Amapá, Amazonas, Maranhão, Pará, Rôndonia, Roraima).

71. Adenocalymma sousae A. H. Gentry, Fl. Veracruz 24: 22. 1982. TYPE: Mexico. Veracruz: Río Chuniapa, Sontecomapa, Los Tuxtlas, 26 Aug. 1974, *M. Sousa 4430* (holotype, MEXU not seen, MEXU as photocopy at MO-2900637!).

Habitat and distribution. This species is found in coastal mangroves along the southernmost Gulf of Mexico (Tabasco, Veracruz; Gentry, 1982).

72. Adenocalymma subincanum Huber, Bull. Soc. Bot. Genève, sér 2, 6: 201. 1914 [1915]. TYPE: Brazil. Pará: Almeirino, Pedreira do Rio Arrayollos, 26 Apr. 1903, *A. Ducke 3524* (holotype, MG not seen; isotype, RB-22708!, RB-22708 as photocopy at MO-2692483!).

Habitat and distribution. This species is found in wet forests in French Guiana and the northeastern to western Amazon basin of Brazil (Acre, Amazonas, Maranhão, Pará) and perhaps Peru (Huánuco).

73. Adenocalymma subsessilifolium DC., in A. DC., Prodr. 9: 199. 1845. TYPE: Brazil. Rio de Janeiro, 1832, *J. Lhotsky s.n.* (holotype, G-DC!, G-DC as photo F neg. 7649 at MO-1692819!).

Habitat and distribution. This species is found in Atlantic forest vegetation in southeastern Brazil (Bahia, Espírito Santo, Minas Gerais, Rio de Janeiro).

74. Adenocalymma subspicatum A. H. Gentry, Novon 3(2): 140. 1993. TYPE: Brazil. Ceará: sítio Pará, Viçosa do Ceará, 12 June 1979, *A. Fernandes, P. Martins & F. Matos s.n.* (holotype, EAC-6501 not seen; isotype, MO-3204488!).

Habitat and distribution. This species is found in dry carrasco and caatinga vegetation in northeastern Brazil (Ceará, Maranhão, Piauí).

75. Adenocalymma tanaeciicarpum (A. H. Gentry) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 270. 2008. *Memora tanaeciicarpa* A. H. Gentry, Ann. Missouri Bot. Gard. 63(1): 57. 1976. TYPE: Brazil. Amazonas: s. loc., 16 May 1972, *A. Loureiro, O. Pires & [initial unknown] Athengildo INPA-35794* (holotype, MO-2228097!; isotype, INPA-35794!).

Habitat and distribution. This species is found in flooded lowland riverside forest vegetation (Gentry, 1997) in Colombia (Vaupés), Venezuela (Amazonas, Bolívar), Guyana, Suriname, French Guiana, and Brazil (Amazonas, Pará).

76. Adenocalymma ternatum (Vell.) Corr. Méllo ex Bureau & K. Schum., Fl. Bras. 8(2): 104. 1896. *Bignonia ternata* Vell., Fl. Flumin. 246. 1825 [1829]; Fl. Flumin. Icon. 6: tab. 21. 1827 [1831]. TYPE: tab. 21 in Vellozo, Fl. Flumin. Icon. 6, 1827 [1831] (lectotype, designated here).

Habitat and distribution. This species is found in Atlantic forest vegetation in eastern and southeastern Brazil (Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Rio de Janeiro).

77. Adenocalymma trichocladum (DC.) L. G. Lohmann, comb. nov. Basionym: *Bignonia trichoclada* DC., in A. DC., Prodr. 9: 158. 1845. *Arrabidaea trichoclada* (DC.) Bureau & K. Schum., Fl. Bras. 8(2): 49. 1896. *Sampaiella trichoclada* (DC.) J. C. Gomes, Rodriguésia 12(23): 108. 1949. *Adenocalymma trichocladum* (DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1:

760. 2010, nom. nud. invalid. TYPE: Brazil. Minas Gerais: s. loc., capões & caatingas, 1818, *C. F. P. von Martius s.n.* (holotype, G-DC!; isotype, M not seen, M as F neg. 20444 at MO-1692862!).

Habitat and distribution. This species is found in dry caatinga vegetation in eastern and southeastern Brazil (Bahia, Minas Gerais, Piauí, São Paulo).

78. Adenocalymma trifoliatum (Vell.) R. C. Laroche, Loefgrenia 56: 5. 1973. *Bignonia trifoliata* Vell., Fl. Flumin. 245. 1825 [1829]; Fl. Flumin. Icon. 6 tab. 16. 1827 [1831]. TYPE: tab. 16 in Vellozo, Fl. Flumin. Icones 6, 1827 [1831] (lectotype, designated by Laroche [1973: 5]).

Habitat and distribution. This species is found in Atlantic forest vegetation in Brazil (Bahia, Goiás, Minas Gerais, Rio de Janeiro, São Paulo).

79. Adenocalymma ubatubense Assis & Semir, Novon 9(2): 136, fig. 1. 1999, as "*ubatubensis*." TYPE: Brazil. São Paulo: Ubatuba, Picinguaba, 9 May 1990, *R. Romero et al. 74* [sic. in sched., other collectors not named] (holotype, HRCB not seen; isotype, MO-04957521!).

Habitat and distribution. This species is known only from Atlantic forest vegetation in the Ubatuba region in southeastern Brazil (São Paulo).

80. Adenocalymma uleanum Kraenzl., Notizbl. Königl. Bot. Gart. Berlin 6: 372. 1915. TYPE: Peru. Loreto: Yurimaguas, Aug. 1902, *E. Ule 6280* (lectotype, designated here, MG-6151 not seen, MG-6151 as photo K neg. 5472 at K!).

Nomenclatural note. Two syntypes were cited in the protologue, *Ule 6280* and *Ule 9784*, the latter from Seringal Auristella, Alto Acre, Brazil. Only one syntype has been located, and it is here designated as the lectotype.

Habitat and distribution. This species is found in wet lowland forest vegetation in Peru (Huánuco, Loreto, Madre de Dios, Pasco, Puno), Bolivia, and Brazil (Rondônia).

81. Adenocalymma validum (K. Schum.). L. G. Lohmann, comb. nov. Basionym: *Memora valida* K. Schum., Nat. Pflanzenfam. 4(3b): 225. 1894. TYPE: Brazil, s. loc., s.d., *F. Sellow 591* (syntype, B†, B as photo as F neg. 18444 at MO-1693009!), *L. Riedel 756* (syntype, LE not seen, LE as photocopy at MO-297030!).

Bignonia flavida DC., in A. DC., Prodr. 9: 168. 1845, non *Adenocalymma flavidum* Miers, 1861. *Pleonotoma flavida* (DC.) Miers, Proc. Roy. Hort. Soc. London 3: 185. 1863. *Memora flavida* (DC.) Bureau & K. Schum., Fl. Bras. 8(2): 264. 1896 [1897]. *Adenocalymma flavidum* (DC.) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 270. 2008, hom. illeg., non *Adenocalymma flavidum* Miers, 1861. *Adenocalymma neoflavida* L. G. Lohmann, Cat. Pl. Fung. Brasil. 1: 769, 2010, nom. nud. invalid. TYPE: Brazil. Pará: Paracajo, Nov. 1819, *C. F. P. von Martius s.n.* (lectotype, designated here, M-86274!, M as photo F neg. 20484 at MO-1693003!; isolectotypes, M-86275!, M-86276!, M-86277!).

Nomenclatural note. The name *Bignonia flavida* is the oldest name for this species, but the epithet "flavidum" has already been used in *Adenocalymma* for another species, *A. flavidum* Miers, and thus cannot be the name for this species. The name *Memora valida* also applies to this species and is therefore here transferred to *Adenocalymma* as the name for this species. The unpublished name that was previously proposed as a replacement name for this species, "A. neoflavidum," is not needed and therefore should not be published, and would be illegitimate if it were published. The type of *M. valida* was not noted in the protologue, which was very synoptic. In their contemporaneous and more detailed treatment, Bureau and Schumann (1896: 264) cited two specimens that are here assumed to comprise the original material on which the description of this species is based. The information available about these materials is currently inadequate to further clarify the typification of *M. valida*. On the other hand, original material of *B. flavida* is deposited at M, where there are four duplicates of the type. The best material is here chosen as the lectotype.

Habitat and distribution. This species is widely distributed in wet and humid forest vegetation in Colombia (Amazonas), Guyana, Suriname, French Guiana, and Brazil (Amazonas, Bahia, Espírito Santo, Pará).

82. Adenocalymma velutinum (A. H. Gentry ex Hauk) L. G. Lohmann, comb. nov. Basionym: *Memora velutina* A. H. Gentry ex Hauk, Novon 9(1): 52, fig. 3. 1999. *Adenocalymma velutinum* (A. H. Gentry ex Hauk) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 770. 2010, nom. nud. invalid. TYPE: Brazil. Pará: BR-230, 188 km W of Altamira, 30 Nov. 1977, *G. T. Prance, A. S. Silva, M. J. Balick, A. J. Henderson, B. W. Nelson & R. P. Bahia 25891* (holotype, INPA not seen; isotypes, MO-2627549!, NY [barcode] NY00073992!, US not seen).

Habitat and distribution. This species is known only from the type collection, from lowland wet forest vegetation in northeastern Brazil (Pará).

II. Amphilophium Kunth, J. Phys. Chim. Hist. Nat. Arts 87: 451. 1818, emend. L. G. Lohmann. TYPE: *Amphilophium paniculatum* (L.) Kunth (lecotype, designated by Fabris [1964: 456]).

Haplolophium Cham., Linnaea 7: 556. 1832 [1833], as "*Aplolophium*," syn. nov. TYPE: *Haplolophium bracteatum* Cham. [≡ *Amphilophium bracteatum* (Cham.) L. G. Lohmann].

Endoloma Raf., Sylva Tellur. 79. 1838. TYPE: *Endoloma purpurea* Raf., nom. illeg. superfl. [≡ *Amphilophium paniculatum* (L.) Kunth].

Distictis Mart. ex Meisn., Pl. Vasc. Gen. 1: 300, 2: 280. 1840, syn. nov. TYPE: *Distictis lactiflora* (Vahl) DC. (lectotype, designated by Sandwith [1962: 454]) [≡ *Amphilophium lactiflorum* (Vahl) L. G. Lohmann].

Pithecoctenium Mart. ex DC., in Meisn., Pl. Vasc. Gen. 1: 300, 2: 208. 1840, syn. nov. *Pithecoxanium*, orth. var. TYPE: *Pithecoctenium echinatum* (Jacq.) Baill. (lectotype, designated by Sandwith [1962: 454]) [= *Amphilophium crucigerum* (L.) L. G. Lohmann].

Phaedranthus Miers, Proc. Roy. Hort. Soc. London 3: 182. 1863. nom. cons., vs. *Sererea* Raf. TYPE: *Phaedranthus lindleyanus* Miers [= *Amphilophium buccinatorium* (DC.) L. G. Lohmann].

Macrodiscus Bureau, Monogr. Bignon. 46, tab. 11. 1864. TYPE: *Macrodiscus rigescens* (Jacq.) Bureau [= *Amphilophium lactiflorum* (Vahl) L. G. Lohmann].

Glaziova Bureau, Adansonia 8: 380. 1868, syn. nov., *Glaziovia*, orth. var. TYPE: *Glaziova bauhinioides* Bureau ex Baill. [≡ *Amphilophium bauhinioides* (Bureau ex Baill.) L. G. Lohmann].

Neves-armondia K. Schum., Nat. Pflanzenfam. Nachtrage Teil 2–4(1): 301, 302. 1897. TYPE: *Neves-armondia cordifolia* (Mart.) K. Schum. [= *Amphilophium falcatum* (Vell.) L. G. Lohmann].

Distictella Kuntze, Lex. Gen. Pl. 182. 1904 [1903], syn. nov. TYPE: *Distictella mansoana* (DC.) Urb. (lectotype, designated by Sandwith [1965: 412]) [≡ *Amphilophium mansoanum* (DC.) L. G. Lohmann].

Wunschmannia Urb., Symb. Antill. 5: 494. 1908. TYPE: *Wunschmannia staminea* (Lam.) Urb. [≡ *Amphilophium stamineum* (Lam.) L. G. Lohmann].

Urbanolophium Melch., Feddes Repert. Beih. 46: 79. 1927, syn. nov. TYPE: *Urbanolophium glaziovii* (Bureau ex K. Schum.) Melch. [= *Amphilophium dusenianum* (Kraenzl.) L. G. Lohmann].

Anomoctenium Pichon, Bull. Soc. Bot. France 92: 226. 1946. TYPE: *Anomoctenium stipulare* (Mart. ex DC.) Pichon [= *Amphilophium frutescens* (DC.) L. G. Lohmann].

Bothriopodium Rizzini, Arch. Jard. Bot. Rio de Janeiro 9: 70. 1949. TYPE: *Bothriopodium glaziovii* (Bureau ex K. Schum.) Rizzini [= *Amphilophium dusenianum* (Kraenzl.) L. G. Lohmann].

Lianas (shrubs), with (without) dimorphic juvenile growth, without strong odor; stems with phloem wedges in multiples of 4 in cross-section, pith solid; branchlets sharply hexagonal or cylindrical, pubescent, without lenticels, without interpetiolar glands, with discontinuous interpetiolar ridge, with epidermis not peeling; prophylls of axillary buds elliptic and foliaceous, with glands. Leaves (1-)2- or 3-foliolate, terminal leaflet often replaced by a trifid (multifid) tendril, tendrils with adhesive disks, without uncinate apices; leaflets coriaceous (membranaceous), with glands sparsely distributed over blade or grouped in vein axils, without pellucid punctations, without domatia, petiolules not articulated; petiole cylindrical, never modified into a tendril, not articulated. Inflorescence terminal and/or axillary, a thyrse or raceme. Flowers zygomorphic, pentamerous; calyx cupular, truncate or shortly 5-lobed and frequently with double calyx, coriaceous (membranaceous), puberulous or villose externally, with clusters of glands near margins; corolla white or yellow (magenta, pink, red), without nectar guides, tubular or infundibuliform, straight in tube or bent at ca 90° above base, coriaceous, puberulous to villose (glabrous or lepidote) externally, with glands in lines near margins, lobes 5, imbricate; stamens 4, with well-developed filaments, included (exserted), anthers glabrous, thecae straight, pollen in monads, colpate or inaperturate, with exine reticulate; ovary sessile, smooth and puberulous or villose externally, ovules in multiple series on each placenta, stigma rhombic or lanceolate, glabrous; disk annular. Capsules elliptic, inflated or flattened, straight or curved, woody, with valves 2, puberulous to villose, without lenticels, with or without glands, without wings, smooth or with ridges, tuberculate, and/or echinate, with calyx caducous; seeds winged (wings reduced), with body papillate or densely pubescent, wings opaque or hyaline, linear. Figures 6, 7.

Number of species, distribution, and habitat. *Amphilophium* includes 47 species found in wet to dry forest, savanna, campinas, and thorn scrub vegetation from Mexico and the Antilles to Argentina and southern Brazil.

Amphilophium is circumscribed here much more broadly than by previous authors to include several previously separated genera, in particular *Haplolophium*, *Glaziova*, *Distictis*, *Distictella*, and *Pithecoctenium*. In this new circumscription *Amphilophium* can be recognized vegetatively by its trifid tendrils terminating in adhesive disks (a synapomorphy of the genus) and the elliptic foliaceous prophylls of the axillary buds that are developed in most species. In flower, *Amphilophium* can be recognized by the coriaceous, cupular, densely pubescent and glandular calyx that is frequently unusual in being doubled or divided distally into two concentric rims, together with the coriaceous corolla that is externally

pubescent and has glands clustered close to the margins. The corollas are adapted for pollination by large and mid-sized bees, including Xylocopid bees, which are typical nectar thieves of other Bignonieae that have thinner-textured corollas that those bees can penetrate more easily (Gentry, 1990). In fruit, *Amphilophium* is immediately recognizable by the seeds with a pubescent or papillate seed coat (Fig. 4C, D), another synapomorphy of the genus. The only other species with a similarly glandular calyx plus a thick-textured corolla is *Tanaecium tetragonolobum* (Jacq.) L. G. Lohmann. However, *T. tetragonolobum* can be separated from *Amphilophium* by its stems with four phloem wedges and its bromeliad-like prophylls on the axillary buds.

The close relationship between *Amphilophium*, *Distictella*, *Glaziova*, *Haplolophium*, *Neves-armondia*, *Pithecoctenium*, and *Urbanolophium* was first noted by Melchior (1927), who placed these seven genera into his subtribe Pithecocteniinae. However, he did not include *Distictis* here, even though it shares several of the characters of his Pithecocteniinae. The genera of Melchior's Pithecocteniinae plus *Distictis* are well characterized morphologically and form a monophyletic group in this present analysis (Fig. 8). The circumscription of genera within this group has long been controversial because the genera have been characterized by combinations of characters, with the individual characters each found in several of the genera. For example, as illustrated in Figure 8, *Distictella* has been diagnosed by the combination of cylindrical stems (also present in species of *Glaziova*), glands grouped at the axils of leaflets (also present in species of *Distictis* and *Pithecoctenium*), corollas bent at a 90° angle above the base (Fig. 7P; also present in *Glaziova* and *Pithecoctenium*), a cupular, truncate, densely pubescent calyx with glands clustered near the margin (Fig. 7P; also found in *Distictis* and *Pithecoctenium*), fruits curved and glandular (often found in species of *Distictis*), and a papillate seed body (also found in some species of *Distictis*). The diagnostic characters of the other genera of Pithecocteniinae are similarly overlapping; for example, *Amphilophium*, *Haplolophium*, and *Glaziova* were all distinguished in part by the distinctive double calyx (Fig. 7B, E), thyrsoid inflorescences, and colpate pollen, and then were separated from each other based on the bilabiate corolla that remains closed at anthesis in *Amphilophium* (Fig. 7B), the cylindrical stems of *Glaziova*, and the hexagonal stems of *Haplolophium*. The similarity among these genera was noted by Gentry (1976: 55): "*Haplolophium* is intermediate between *Pithecoctenium* and *Amphilophium*, agreeing with the former in its tubular bent corollas, simple calyx, and echinate fruit, and with the latter in its pollen, trifid tendrils, dendroid trichomes, and the presence of a frilly calyx margin." Similarly, *Distictis* and *Pithecoctenium* share racemose inflorescences (also found in *Distictella*), villose and lepidote ovaries (also found in *Haplolophium*), and inaperturate pollen (also found in *Distictella*). However, *Pithecoctenium* was separated based on its echinate fruits (Fig. 7I), even though not all species of *Pithecoctenium* have echinate fruits (Pool, 2007a). *Phaedranthus* was initially considered related to *Pithecoctenium*, even though its fruit was unknown; later Gentry (1979: 237) concluded that "the fruit of *Phaedranthus* is very close to that of *Distictis* but only remotely similar to that of *Pithecoctenium*."

The phylogeny hypothesis of the tribe Bignonieae (Lohmann, 2006; Fig. 2) groups all of these genera in a single, strongly supported monophyletic clade that is characterized by several morphological synapomorphies (Fig. 8). This analysis also suggests that this clade comprises two subclades, one composed of *Distictella* and the other including the remaining genera of the Pithecocteniinae. In this second subclade, there are three groups that are generally distinguishable by morphology, though their characterization is incomplete (Fig. 8). These are *Distictis*, *Pithecoctenium*, and the double-calyx group, which includes *Amphilophium* s. str., *Haplolophium*, and *Glaziova*. However, *Distictis* and *Pithecoctenium* individually cannot be characterized by any single morphological synapomorphy, making the taxonomic recognition of the double-calyx group impractical because this would require recognition of both *Distictis* and *Pithecoctenium*. Therefore, a broader generic circumscription is more appropriate, because it leads to a better characterized and recognizable genus morphologically, and because it is more informative regarding the actual patterns of morphological variation and relationships in this group. Therefore a broadly circumscribed *Amphilophium* is here characterized by multiples of four phloem wedges; dimorphic juvenile growth; foliaceous glandular prophylls of the axillary buds; trifid to multifid tendrils; a calyx that is coriaceous, cupular, truncate, and villose and has glands in fields next to the margins; corollas that are generally white, curved, and villose externally and have glands clustered next to the margins; fruits that are elliptic, woody, generally glandular, and tuberculate or echinate; and papillate or pubescent seeds (Fig. 4C, D).

1. Amphilophium arenarium (A. H. Gentry) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 270. 2008. *Distictella arenaria* A. H. Gentry, Mem.

New York Bot. Gard. 29(1): 273. 1978. TYPE: Venezuela. Amazonas: 18 km S of Samarapo towards Río Sipapo, 125 m, roadside, 29 June 1975, *A. H. Gentry & P. Berry 14615* (holotype, MO-2420903!; isotypes, NY [barcode] NY00328773!, VEN not seen).

Habitat and distribution. This species is found in shrubby and riparian lowland vegetation (Gentry, 1997) in Colombia (Vaupés, Vichada) and Venezuela (Amazonas, Bolívar).

2. Amphilophium aschersonii Ule, in Urb. & Graeb., Festschr. Aschers. 549. 1904. TYPE: Peru. Loreto: Iquitos, Apr. 1903, *E. Ule 6813* (holotype, HBG not seen, HBG as photo F neg. 18445 at MO-1692825!; isotype, K!).

Habitat and distribution. This species is found in humid lowland to montane forest vegetation (Gentry, 1997) in Colombia (Caquetá, Meta), Venezuela (Amazonas, Barinas, Táchira), Ecuador, Peru (Amazonas, Huánuco, Loreto, Madre de Dios, Pasco, San Martín, Ucayali), Bolivia, and Brazil (Acre, Amazonas).

3. Amphilophium bauhinioides (Bureau ex Baill.) L. G. Lohmann, comb. nov. Basionym: *Glaziova bauhinioides* Bureau ex Baill., Hist. Pl. 10: 38. 1888, as "*Glaziovia*." *Glaziovia bauhiniopsis*, orth. var. *Amphilophium bauhinioides* (Bureau ex Baill.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 761. 2010, nom. nud. invalid. TYPE: Brazil. Rio de Janeiro: Gávea, Quatro-Patacas, 26 Apr. 1870, *A. Glaziou 651* (lectotype, designated here, P [barcode] P00481537!; isolectotypes, BR [barcode] BR00880346!, BR [barcode] BR00880379!, MO-2762336!, F-997872 image!, P [barcode] P00481538!).

Nomenclatural note. Baillon (1888) cited as the type of *Glaziova bauhinioides* a collection made by Glaziou in Brazil, but did not list a collection number or herbarium. Hence, the best material deposited at the P herbarium that matches the locality and species described by Baillon is here chosen as a lectotype.

Habitat and distribution. This species is found in wet areas of Altantic forest vegetation in eastern Brazil (Bahia, Distrito Federal, Espírito Santo, Minas Gerais, Rio de Janeiro).

4. Amphilophium blanchetii (DC.) Bureau & K. Schum., Fl. Bras. 8(2): 210. 1896. *Haplolophium blanchetii* DC., in A. DC., Prodr. 9: 192. 1845. TYPE: Brazil. Bahia: Rio São Francisco, Serra de Açuruá, 1839, *J. S. Blanchet 2849* (holotype, G-DC!, G-DC as photo F neg. 7659 at MO-1692958!; isotypes, G-14127!, G-14109!, NY-313079!, P [barcode] P00481499!, P as photocopy at MO-2294584!, MO-3841405!).

Habitat and distribution. This species is found in forest vegetation in eastern Brazil (Bahia).

5. Amphilophium bracteatum (Cham.) L. G. Lohmann, comb. nov. Basionym: *Haplolophium bracteatum* Cham., Linnaea 7: 556. 1832 [1833]. *Amphilophium bracteatum* (Cham.) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1582. 2008, nom. nud. invalid. *Amphilophium bracteatum* (Cham.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 761. 2010, nom. nud. invalid. TYPE: Brazil. São Paulo: meridional portion of the state, s.d., *F. Sellow s.n.* (holotype, LE not seen; isotypes, B†, B as photo F neg. 18441 at MO-1692757!, MO-2495171!, NY-328853!).

Habitat and distribution. This species is found in forest vegetation in eastern and southeastern Brazil (Goiás, Minas Gerais, Paraná, Rio de Janeiro, São Paulo).

6. Amphilophium buccinatorium (DC.) L. G. Lohmann, comb. nov. Basionym: *Pithecoctenium buccinatorium* DC., in A. DC., Prodr. 9: 195. 1845. *Pithecoctenium buccinatorium* var. *subinclusum* DC., in A. DC., Prodr. 9: 195. 1845, nom. illeg. superfl. *Phaedranthus buccinatorius* (DC.) Miers, Proc. Roy. Hort. Soc. London 3: 182. 1863, as "*buccinatorum*." *Bignonia buccinatoria* (DC.) Mairet ex Hemsl., Biol. Cent.-Amer., Bot. 2: 490. 1882. *Distictis buccinatoria* (DC.) A. H. Gentry, Brittonia 25(3): 237. 1973, as "*buccinatorum*." TYPE: Mexico. s. loc., 1833, *M. Mairet de la Chaudefont s.n.* (lectotype, selected by Pool [2007a: 802], G-DC!, G-DC as photo F neg. 7655 at MO-1693024!).

Habitat and distribution. This species is found on rocky outcrops at 1700–2300 m in Mexico (Chiapas, Guanajuato, Jalisco, México, Morelos, Puebla, San Luis Potosí, Tlaxcala; Pool, 2007a).

7. Amphilophium campinae (A. Samp.) L. G. Lohmann, comb. nov. Basionym: *Distictella campinae* A. Samp., Ann. Acad. Brasil. Sci. 7: 120. 1935. TYPE: Brazil. Pará: campinas near Vigia, 21 June 1927 [26 June 1926], *A. Ducke s.n. RB-22688* (holotype, RB-22688!, RB-22688

as photo K neg. 4699 at K!; isotype, MO-2192053!).

Habitat and distribution. This species is known from savanna and campinas vegetation on white sand substrates in Brazilian Amazonia (Amazonas, Pará, Rôndonia; Pool, 2009).

8. Amphilophium carolinae (Lindl.) L. G. Lohmann, comb. nov. Basionym: *Bignonia carolinae* Lindl., Edward's Bot. Reg. 28: sub tab. 45. 1842. *Pithecoctenium carolinae* (Lindl.) G. Nicholson, Ill. Gard. Dict. 3: 152. 1886. TYPE: from cultivated material at Melbury, Lord Ilchester's seat in Dorsetshire [England], 1842, *s. coll. s.n.* (holotype, CGE not seen).

Nomenclatural note. The taxonomy of this species follows Pool (2007a), who synonymized *Pithecoctenium cynanchoides* DC. under this older name based on exemplary taxonomic detective work. This species has sometimes been incorrectly called "Amphilophium cynanchoides," but this latter name is not validly published (e.g., Arbo & Lohmann, 2008).

Habitat and distribution. This species is known from dry forests, thorn scrub, and disturbed vegetation in southern Bolivia, Paraguay, western Uruguay, and Argentina (Chaco, Corrientes, Santiago del Estero, Tucumán; Pool, 2007a).

9. Amphilophium chocoense (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Distictella chocoensis* A. H. Gentry, Phytologia 47(2): 100. 1980. TYPE: Colombia. Chocó: ca. 10 km W of River Quito on Pan American Hwy. (under construction), W of Las Animas, 110 m, 12 Jan. 1979, *A. H. Gentry & E. Renteria 24089* (holotype, COL-232359 image!; isotypes, MO-2717216!, MO-2717217!).

Habitat and distribution. This species is found in lowland wet forest vegetation in western Colombia (Chocó, Valle del Cauca; Pool, 2009).

10. Amphilophium cremersii (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Distictella cremersii* A. H. Gentry, Phytologia 46(4): 209. 1980. TYPE: French Guiana. Along River Tampoc, close to River Alice, 1 Apr. 1977, *G. Cremers 4589* (holotype, MO-2589099!; isotypes, CAY!, P [barcode] P00468594!).

Habitat and distribution. This species is found in riparian forest, at least sometimes on white sand substrates, in Suriname, French Guiana, and Brazil (Pará; Pool, 2009).

11. Amphilophium crucigerum (L.) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 270. 2008. *Bignonia crucigera* L., Sp. Pl. 2: 624. 1753. *Anisostichus crucigera* (L.) Bureau ex Small, Man. S. E. Fl. 1240. 1933. *Pithecoctenium crucigerum* (L.) A. H. Gentry, Taxon 24(1): 123. 1975. TYPE: Morison, Plantae Historiae pars tertia, Oxford s. 15, tab. 3, fig. 6. 1699 (lectotype, designated by Barrie et al. [1991: 265]).

Habitat and distribution. This species is found in semideciduous to evergreen forest and disturbed vegetation (Gentry, 1997) in Mexico (Campeche, Chiapas, Colima, Guanajuato, Guerrero, Jalisco, México, Michoacán, Morelos, Nayarit, Oaxaca, Puebla, Querétaro, San Luis Potosí, Sinaloa, Tabasco, Tamaulipas, Veracruz, Yucatán), the Greater Antilles (Cuba, Jamaica), Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Atlántico, Bolívar, Cauca, Chocó, La Guajira, Madgalena, Nariño, Sucre, Valle del Cauca), Venezuela (Anzoátegui, Apure, Aragua, Barinas, Carabobo, Cojedes, Guárico, Lara, Mérida, Miranda, Portuguesa, Táchira, Zulia), Trinidad and Tobago, Suriname, French Guiana, Ecuador, Peru (Amazonas, Cajamarca, Cusco, Huánuco, Junín, Loreto, Madre de Dios, San Martín), Bolivia, Paraguay, Brazil (Acre, Amazonas, Bahia, Ceará, Espírito Santo, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraíba, Paraná, Pernambuco, Piauí, Rio de Janeiro, São Paulo, Rio Grande do Sul), Uruguay, and Argentina (Corrientes, Jujuy, Misiones, Salta).

12. Amphilophium cuneifolium (DC.) L. G. Lohmann, comb. nov. Basionym: *Pithecoctenium cuneifolium* DC., in A. DC., Prodr. 9: 196. 1845. *Distictella cuneifolia* (DC.) Sandwith, Kew Bull. 8(4): 476. 1953 [1954]. *Amphilophium cuneifolium* (DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 761. 2010, nom. nud. invalid. TYPE: Brazil. Pará: s. loc., s.d., *Anonymous s.n.* (holotype, P [barcode] P00468595!; isotype, G-DC!).

Habitat and distribution. This species is found in savanna vegetation, at least sometimes in seasonally inundated sites on black soil substrates, in northern Bolivia (Pool, 2009).

13. Amphilophium dasytrichum (Sandwith) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 270. 2008. *Distictella dasytricha* Sandwith, Kew Bull. 8(4): 476. 1953 [1954]. TYPE: Brazil. Goiás: Queixada, Jataí, 8 July 1949, *A. Macedo 1906* (holotype, K!; isotypes, G!, MO-1622581!, NY

[barcode] NY000328774!, US-2196739 image!, US-2196740 image!, US-2168886 image!).

Habitat and distribution. This species is found in evergreen lowland forest vegetation (Gentry, 1997) in northern Bolivia and Brazil (Acre, Goiás) (Pool, 2009).

14. Amphilophium dolichoides (Cham.) L. G. Lohmann, comb. nov. Basionym: *Bignonia dolichoides* Cham., Linnaea 7: 696. 1832 [1833]. *Pithecoctenium dolichoides* (Cham.) Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 218. 1894. *Amphilophium dolichoides* (Cham.) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1583. 2008, nom. nud. invalid. *Amphilophium dolichoides* (Cham.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 761. 2010, nom. nud. invalid. TYPE: Brazil. s. loc., s.d., *F. Sellow 332* (holotype, LE not seen; isotype, B†, B as photo F neg. 18484 at MO-1692888!).

Nomenclatural note. Pool (2007a: 635) cited the holotype specimen of *Bignonia dolichoides* Cham. as the Sellow specimen identified as such at B, which was destroyed, but did not lectotypify this name. However, Chamisso's original materials are mainly deposited at LE, including a specimen set collected by Sellow in Brazil, and the holotype is expected to be there, but those collections have not yet been studied in detail.

Habitat and distribution. This species is found in Atlantic forest vegetation in Brazil (Minas Gerais, Paraná, Rio de Janeiro, Santa Catarina, São Paulo; Pool, 2007a).

15. Amphilophium dusenianum (Kraenzl.) L. G. Lohmann, comb. nov. Basionym: *Haplolophium dusenianum* Kraenzl., Repert. Spec. Nov. Regni Veg. 17: 118. 1921. *Urbanolophium dusenianum* (Kraenzl.) Melch., Repert. Spec. Nov. Regni Veg. Beih. 46: 81. 1927. *Urbaniella duseniana*, orth. var. TYPE: Brazil. Paraná: Capão Grande, 25 Apr. 1909, *P. Dusén 8015* (lectotype, designated by Melchior [1927: 81], S not seen; isolectotypes, BM not seen, MO-931681!).

Pithecoctenium glaziovii Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 218. 1894, non *Amphilophium glaziovii* Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 222. 1894. *Distictis glaziovii* (Bureau ex K. Schum.) Bureau & K. Schum., Fl. Bras. 8(2): 180. 1896. *Urbanolophium glaziovii* (Bureau ex K. Schum.) Melch., Repert. Spec. Nov. Regni Veg. Beih. 46: 80. 1927. *Bothriopodium glaziovii* (Bureau ex K. Schum.) Rizzini, Arch. Jard. Bot. Rio de Janeiro 9: 71. 1949. *Haplolophium glaziovii* (Bureau ex K. Schum) A. H. Gentry, Novon 2(2): 164. 1992. *Amphilophium neoglaziovii* L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 761. 2010, nom. nud. invalid. TYPE: Brazil. Rio de Janeiro, Serra dos Orgãos, s.d., *J. Saldanha 7445* (lectotype, selected by Melchior [1927: 81], B†; isolectotypes, K!, P [barcode] P00481539!).

Nomenclatural note. The oldest name for this species is *Pithecoctenium glaziovii*, but that name cannot be transferred to *Amphilophium* because the name *A. glaziovii* has already been published for another species and thus cannot be used for this species. The published name *Haplolophium dusenianum* also applies to this species and is the next oldest name for it, therefore the combination *A. dusenianum* is made here for this species. The protologue of *H. dusenianum* cited four syntype specimens, *Dusén 8015*, *Dusén 7207*, *Dusén 9493*, and *Dusén 7914*. Melchior (1927) subsequently listed the collection *Dusén 8015* at S as the type of this name, effectively lectotypifying it. Gentry (1992a: 165) later apparently intended to designate the specimen *Dusén 8015* at BM as the lectotype of *H. dusenianum* Kraenzl., without explicit discussion and apparently without realizing that Melchior previously lectotypified this name, but Melchior's choice seems to have priority. Also Gentry (1992a: 165) cited the name *Urbanolophium dusenianum* (Kraenzl.) Melch. incorrectly as "*Urbaniella duseniana* (Kraenzl.) Dusén ex Melch.," with the genus incorrectly spelled and with Dusén added as an author; Melchior, however, did not credit Dusén as an author in his original publication of this combination. No specimens were cited in the protologue of *Pithecoctenium glaziovii* Bureau ex K. Schum., but two specimens were cited by Bureau and Schumann (1896) in their contemporaneous and more detailed treatment, *Saldanha 7445* and *Glaziou 17705*. Melchior chose the first of these as the lectotype, without explanation. Gentry later (1992a: 165) cited *Saldanha 7445* simply as the type of this name, and apparently overlooked Melchior's lectotypification here also. Melchior's lectotype has since been destroyed; further study is needed before a new lectotype is chosen.

Habitat and distribution. This species is found in Atlantic forest vegetation in Brazil (Goiás, Minas Gerais, Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina).

16. Amphilophium ecuadorense A. H. Gentry, Phytologia 35(3): 183. 1977. TYPE: Ecuador. Guayas: Cerro Bella Vista near Julio Moreno, 29 Aug. 1965, *C. Játiva & C. Epling 974* (holotype, NY-82782!; isotypes, MO-2376674!, S not seen, S as photocopy at MO-2376674!).

Habitat and distribution. This species is found in dry forest vegetation in western Ecuador and northwestern Peru (Cajamarca, Piura, Tumbes).

17. Amphilophium elongatum (Vahl) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 270. 2008. *Bignonia elongata* Vahl, Eclog. Amer. 2: 45, tab. 16. 1798. *Pithecoctenium elongatum* (Vahl) Klotzsch, in M. R. Schomb., Reis. Br.-Guiana 3: 1158. 1848 [1849]. *Doxantha elongata* (Vahl) Miers, Proc. Roy. Soc. London 3: 190. 1863. *Distictis elongata* (Vahl) Bureau ex Benth., Gen. Pl. 2: 1038. 1876. *Distictella elongata* (Vahl) Urb., Repert. Spec. Nov. Regni Veg. 14: 310. 1916. TYPE: French Guiana. Cayenne, s.d., *J. P. von Rohr 2001* (lectotype, designated by Gentry [1983a: 174], C not seen, C as photo F neg. 22130 at MO-1693028!).

Habitat and distribution. This species as circumscribed by Pool (2009), who is followed here, is found in lowland secondary forest vegetation, frequently on white sand substrates, in Suriname, French Guiana, and Brazil (Amazonas, Pará, Rôndonia).

18. Amphilophium falcatum (Vell.) L. G. Lohmann, comb. nov. Basionym: *Bignonia falcata* Vell., Fl. Flumin. 245. 1825 [1829]; Fl. Flumin. Icon. 6: tab. 17. 1827 [1831]. *Pithecoctenium falcatum* (Vell.) A. Pool, Ann. Missouri Bot. Gard. 94(3): 635, fig. 2. 2007. *Amphilophium falcatum* (Vell.) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1583. 2008, nom. nud. invalid. *Amphilophium falcatum* (Vell.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 761. 2010, nom. nud. invalid. TYPE: tab. 17 in Vellozo, Fl. Flumin. Icon. 6, pro parte, including branchlet, leaves, fruits, seeds, 1827 [1831] (lectotype, selected by Pool [2007a: 635]); Brazil, Bahia, Coaraci, Almandina, 18 km de estrada, 5 Feb. 1970, *T. S. dos Santos 574* (epitype, designated by Pool [2007a: 635], MO-2627389!; duplicates, CEPEC not seen, NY not seen).

Nomenclatural note. Pool (2007a: 636, fig. 2) reprinted Vellozo's plate from the protologue of this *Bignonia falcata* and designated part of this as the lectotype of this name but explicitly excluded the inflorescence and flowers of that illustration. She considered this plate to be a composite drawing, with the inflorescence and flowers belonging to a different species in a different genus that she did not identify.

Habitat and distribution. This species is found in disturbed humid vegetation and Atlantic forest vegetation in eastern Bolivia and Brazil (Bahia, Goiás, Minas Gerais, Paraná, Rio de Janeiro, São Paulo).

19. Amphilophium frutescens (DC.) L. G. Lohmann, comb. nov. Basionym: *Pithecoctenium frutescens* DC., in A. DC., Prodr. 9: 196. 1845. *Distictis frutescens* (DC.) A. Pool, Ann. Missouri Bot. Gard. 94 (4): 804. 2007. *Amphilophium frutescens* (DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 761. 2010, nom. nud. invalid. TYPE: Brazil. s. loc., 1832, *J. Lhotsky s.n.* (holotype G-DC!, G-DC as photo F neg. 7651 at MO-1693029!; isotype, F not seen).

Nomenclatural note. The names *Pithecoctenium frutescens* DC. and *P. stipulare* Mart. ex DC. were published simultaneously, and both apply to the same species. Pool (2007b) first synonymized these and chose the name *P. frutescens* for nomenclatural reasons. Prior to that, the names *P. stipulare* and *Distictis stipularis* (Mart. ex DC.) A. H. Gentry were more widely used for this species.

Habitat and distribution. This species is found in wet areas of Atlantic forest vegetation in eastern Brazil (Bahia, Espírito Santo, Minas Gerais, Paraíba, Rio de Janeiro).

20. Amphilophium glaziovii Bureau ex K. Schum., Nat. Pflanzenfam 4(3b): 222. 1894. TYPE: Brazil: Rio de Janeiro, Santo Antônio, 23 Mar. 1872, *A. Glaziou 5782* (holotype, B†, B as photo F neg. 18446 at MO-1692826!; isotypes, BR not seen, F not seen, MO-2294582!, P [2] not seen, P as photocopies at MO-2295482!, MO-2294583!, and MO-2616850!, S not seen, US-1706131 image!].

Nomenclatural note. More study is needed before the typification of this species can be resolved.

Habitat and distribution. This species is found in Atlantic forest vegetation in eastern Brazil (Minas Gerais, Rio de Janeiro).

21. Amphilophium gnaphalanthum (A. Rich.) L. G. Lohmann, comb. nov. Basionym: *Bignonia gnaphalantha* A. Rich., Hist. Fis. Cuba, Bot. 11: 105. 1850. *Distictis gnaphalantha* (A. Rich.) Greenm., Proc. Amer. Acad. Arts 33: 487. 1898. *Distictis gnaphalantha* (A. Rich.) Urb., Repert. Spec. Nov. Regni. Veg. 14: 310. 1916, comb. superfl. TYPE: Cuba. La Habana, s.d., *R. de la Sagra s.n.* (holotype, P not seen; isotypes, P [2], not seen).

Nomenclatural note. Pool (2007b) clarified the identity of the type of *Bignonia gnaphalantha*, and noted that although Urban (1916) has usually been credited with authorship of the combination *Distictis gnaphalantha*, in fact that combination was made previously by Greenman (1898).

Habitat and distribution. This species is found in lowland forest vegetation on limestone substrates in Cuba.

22. Amphilophium granulosum (Bureau & K. Schum.) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 270. 2008. *Pithecoctenium granulosum* Klotzsch, in M. R. Schomb., Reis. Br.-Guiana 3: 1158. 1848 [1849], nom. nud invalid. *Distictis granulosa* Bureau & K. Schum., Fl. Bras. 8(2): 179. 1896. *Distictella granulosa* (Bureau & K. Schum.) Urb., Repert. Spec. Nov. Regni Veg. 14: 310. 1916. *Pithecoctenium granulosum* (Bureau & K. Schum.) Sprague & Sandwith, Bull. Misc. Inform. Kew 1932: 89. 1932. *Anomoctenium granulosum* (Bureau & K. Schum.) Sandwith, Kew Bull. 19: 413. 1965. TYPE: British Guiana [Guyana]. s. loc., s.d., *M. Rich. Schomburgk 400* (holotype, B†); Guyana, s. loc., s.d., *Rob. H. Schomburgk 229 S* (neotype, designated by Pool [2007b: 807], K [barcode] K000195692).

Nomenclatural note. Pool (2007b) noted that the type of *Distictis granulosa*, *M. Rich Schomburgk 400*, was deposited at B and has been destroyed, and that although Gentry (1983a) cited a duplicate of that collection at K, this has not subsequently been located and is presumed either lost or an erroneous report, and no other duplicates of that collection have been located. Accordingly, she designated a neotype, which was selected from extant specimens cited by Sprague and Sandwith (1932).

Habitat and distribution. This species is found in moist to wet forest and disturbed vegetation, sometimes on white sand substrates, in Colombia (Vaupés), Venezuela (Amazonas, Apure, Bolívar), Suriname, French Guiana, Peru (Madre de Dios, Puno), Bolivia, and Brazil (Acre, Amazonas, Maranhão, Pará, Roraima).

23. Amphilophium lactiflorum (Vahl) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 271. 2008. *Bignonia lactiflora* Vahl, Symb. Bot. 3: 80, tab. 66. 1794. *Distictis lactiflora* (Vahl) DC., in A. DC., Prodr. 9: 191. 1845. *Macrodiscus lactiflorus* (Vahl) Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 216. 1894, as "*lactiflora*." TYPE: U.S. Virgin Islands: St. Croix, Paxacam, July, *F. A. F. C. West s.n.* (holotype, C not seen; isotypes, BM-578580!, W!).

Habitat and distribution. This species is found in dry forest and scrub vegetation, often on limestone substrates, in the Greater Antilles (Cuba, Haiti, Dominican Republic, Puerto Rico) and the U.S. Virgin Islands (St. Croix, St. Thomas).

24. Amphilophium laeve (Sandwith) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 271. 2008, as "*laevis*." *Distictella monophylla* Sandwith var. *laevis* Sandwith, Mem. New York Bot. Gard. 9(3): 362. 1957. *Distictella laevis* (Sandwith) A. H. Gentry, Mem. New York Bot. Gard. 29(1): 274. 1978. TYPE: Venezuela. Amazonas: Cerro Yapacana, Río Orinoco, Savanna no. 1, along trail to gold mine camp, 100 m, 7 Jan. 1951, *B. Maguire, R. S. Cowan & J. J. Wurdack 30788* (holotype, NY [barcode] NY00328776!).

Habitat and distribution. This species is found in shrubby campinas or savanna vegetation on white sand substrates (Gentry, 1997) in Venezuela (Amazonas) and Brazil (Amazonas, Pará).

25. Amphilophium laxiflorum (DC.) L. G. Lohmann, comb. nov. Basionym: *Pithecoctenium laxiflorum* DC., in A. DC., Prodr. 9: 195. 1845. *Distictis laxiflora* (DC.) Greenm., Proc. Amer. Acad. Arts 33: 486. 1898. TYPE: Mexico. Oaxaca: s. loc., July, *G. Andrieux 220* (holotype, G-DC!; isotypes, M not seen, W not seen).

Nomenclatural note. The names *Pithecoctenium laxiflorum* and *P. cinereum* DC. were published simultaneously and were synonymized by Standley (1926) under the name *P. laxiflorum*.

Habitat and distribution. This species is found in deciduous forest vegetation and rocky areas at 1100–2000 m in Mexico (Chiapas, Guanajuato, Jalisco, Oaxaca, Puebla, Veracruz) and Nicaragua (Pool, 2007b), and is cultivated widely in tropical regions.

26. Amphilophium lohmanniae (A. Pool) L. G. Lohmann, comb. nov. Basionym: *Distictella lohmanniae* A. Pool, Ann. Missouri Bot. Gard. 96(2): 304, fig. 3. 2009. TYPE: Brazil. Amazonas: Reserva Florestal Ducke, Manaus–Itacoatiara [Hwy.], Km. 26, 2°53′S, 59°58′W, 20 m, 14 July 1995, *L. G. Lohmann & C. F. da Silva 20* (holotype, MO-6152640!; isotype, INPA!).

Habitat and distribution. This species is found in wet lowland terra firme forest vegetation in Amazonian Brazil (Amazonas).

27. Amphilophium magnoliifolium (Kunth) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 271. 2008. *Bignonia magnoliifolia* Kunth, Nov. Gen. Sp. 3: 136. 1818 [1819], as "*magnoliaefolia*." *Distictella magnoliifolia* (Kunth) Sandwith, Lilloa 3: 460. 1938. TYPE: Venezuela. Amazonas: prope Javita, ad ripam fluminum Tuamini et Temi (Missiones del Orinoco), May 1800, *F. W. H. A. von Humboldt & A. J. A. Bonpland 973* (lectotype, selected by Sandwith [1938: 460], P-Bonpl.!, P-Bonpl. as photo F neg. 39415 at MO-1692923!).

Habitat and distribution. Pool (2009) circumscribed this species more narrowly than previous authors, and separated many plants formerly included here into *Distictella racemosa* (Bureau & K. Schum.) Urb. In her circumscription, followed here, *Amphilophium magnoliifolium* is known from lowland seasonal forest, scrub, and savanna vegetation, usually on white sand substrates, in Colombia (Guanía, Vaupés), Venezuela (Amazonas), and Brazil (Amazonas).

28. Amphilophium mansoanum (DC.) L. G. Lohmann, comb. nov. Basionym: *Bignonia mansoana* DC., in A. DC., Prodr. 9: 157. 1845. *Distictis mansoana* (DC.) Bureau ex B. Verl., Rev. Hort. 40: 154. 1868, as "*mensoana*." *Distictella mansoana* (DC.) Urb., Repert. Spec. Nov. Regni Veg. 14: 310. 1916. *Amphilophium mansoanum* (DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 761. 2010, nom. nud. invalid. TYPE: Brazil. Mato Grosso: close to Cuiabá, 1832, *A. Silva Manso s.n.* (holotype, G-DC!).

Habitat and distribution. This species as circumscribed by Pool (2009), who is followed here, is found in moist forest, disturbed, savanna, and gallery forest vegetation in Peru (Madre de Dios, Puno), eastern Bolivia, and Brazil (Amazonas, Bahia, Distrito Federal, Goiás, Mato Grosso, Minas Gerais, Pará, Rôndonia, Roraima, São Paulo).

29. Amphilophium monophyllum (Sandwith) L. G. Lohmann, comb. nov. Basionym: *Distictella monophylla* Sandwith, Mem. New York Bot. Gard. 9(3): 361. 1957. TYPE: Venezuela. Amazonas: Cerro Sipapo (Paráque), Camp Savanna, 1500 m, 15 Dec. 1948, *B. Maguire & L. Politi 27717* (holotype, K not seen; isotype, NY-328775!).

Habitat and distribution. This species is known from savanna vegetation on white sand substrates (Gentry, 1997) in Colombia (Guanía) and Venezuela (Amazonas).

30. Amphilophium nunezii (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Haplolophium nunezii* A. H. Gentry, Novon 2(2): 163, fig. 2. 1992. TYPE: Peru. Madre de Dios: Tambopata, Cuzco Amazónico, Tourist Lodge, 18 May 1989, *P. Nuñez & O. Phillips 10412* (holotype, MO-3732179!; isotypes, CUZ not seen, G!, NY-328854!, USM not seen).

Habitat and distribution. This species is found in lowland wet forest vegetation in Peru (Cusco, Madre de Dios) and Bolivia.

31. Amphilophium obovatum (Sandwith) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 271. 2008. *Distictella obovata* Sandwith, Mem. New York Bot. Gard. 9: 362. 1957. TYPE: Guyana. Upper Mazaruni River, Kataima, 550 m, 17 Nov. 1951, *B. Maguire & D. B. Fanshawe 32637* (holotype, K!; isotypes, F-1446610 image!, NY-328777!, US-2168886 image!).

Habitat and distribution. This species is found in savanna, disturbed, and forest vegetation, often on white sand substrates, in Venezuela (Bolívar), Guyana, and Brazil (Pará).

32. Amphilophium occidentale (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Distictis occidentalis* A. H. Gentry, Novon 2(2): 161, fig. 1A–B. 1992. TYPE: Colombia. Santander: 3 km N of Yarima on rd. to Albania SE of Barranca Bermeja, 25 July 1975, *A. H. Gentry & L. Forero 15409* (holotype, MO-2340615!; isotype, COL not seen).

Habitat and distribution. This species is found in lowland wet forest vegetation, usually in riverine or seasonally inundated areas, in Colombia (Amazonas, Chocó, Santander), Ecuador, Peru (Amazonas, Cusco, Loreto, Madre de Dios), and eastern Bolivia.

33. Amphilophium paniculatum (L.) Kunth, Nov. Gen. Sp. 3: 149. 1818 [1819]. *Bignonia paniculata* L., Sp. Pl. 2: 623. 1753. *Endoloma purpurea* Raf., Syla Tellur. 80. 1838, nom. illeg. superfl. *Arrabidaea paniculata* (L.) Seem., Trans. Linn. Soc. London 23: 14. 1862. TYPE: Plumier, Pl. Amer., 46, tab. 56, fig. 1, 1756 (lectotype, selected by Howard [1989: 317]).

Habitat and distribution. This species is widely distributed through wet and dry forest vegetation in Mexico (Campeche, Chiapas, Guerrero, Hidalgo, Jalisco, México, Michoacán, Morelos, Nayarit, Oaxaca, Quintana Roo, San Luis Potosí, Sinaloa, Tabasco, Tamaulipas, Veracruz, Yucatán), the Lesser Antilles (Dominica, Guadeloupe, Martinique, St. Vincent), Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Antioquia, Bolívar, Cundinamarca, Nariño, Risaralda, Sucre, Valle del Cauca), Venezuela (Amazonas, Anzoátegui, Aragua, Barinas, Bolívar, Delta Amacuro, Distrito Federal, Falcón, Guárico, Lara, Mérida, Miranda, Portuguesa, Sucre, Yaracuy, Zulia), Trinidad and Tobago, Guyana, Ecuador, Peru (Amazonas, Cajamarca, Cusco, Huánuco, Junín, Loreto, Madre de Dios, Piura, San Martín, Tumbes), Bolivia, Paraguay, Brazil (Acre, Amazonas, Bahia, Ceará, Distrito Federal, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraná, Pernambuco, Rio Grande do Sul, Roraima, Santa Catarina, São Paulo), and Argentina (Chaco, Corrientes, Formosa, Jujuy, Misiones, Salta, Tucumán).

34. Amphilophium pannosum (DC.) Bureau & K. Schum., Fl. Bras. 8(2): 209. 1896. *Bignonia pannosa* DC., in A. DC., Prodr. 9: 148. 1845. TYPE: Peru. s. loc., 1778–1788, *H. Ruiz & J. Pavón s.n.* (holotype, G-14110!, G as photo F neg. 26184 at MO-2131606!).

Habitat and distribution. This species is found in wet to dry forest vegetation in Costa Rica, Panama, Colombia (Antioquia, Cauca, Cundinamarca, Santander, Valle del Cauca), Venezuela (Mérida, Táchira), Ecuador, Peru (Cajamarca, Cusco, Loreto, Pasco), Bolivia, and Argentina (Jujuy, Salta).

35. Amphilophium parkeri (DC.) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 271. 2008. *Bignonia parkeri* DC., in A. DC., Prodr. 9: 157. 1845. *Distictella parkeri* (DC.) Sprague & Sandwith, Bull. Misc. Inform. Kew 1932: 90. 1932. TYPE: Guyana. Demerara River, 1826, *Parker s.n.* (holotype, G-DC!, G-DC as photo F neg. 7637 at MO-1692900!; isotype, K!).

Habitat and distribution. This species as circumscribed by Pool (2009), who is followed here, is found in wet forest and disturbed vegetation, often on white sand substrates, widely but apparently not frequently in Colombia (Amazonas), Venezuela (Bolívar), Guyana, Suriname, French Guiana, and Brazil (Amapá).

36. Amphilophium pauciflorum (A. H. Gentry) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 271. 2008. *Distictella pauciflora* A. H. Gentry, Ann. Missouri Bot. Gard. 61(3): 872. 1974. TYPE: Venezuela. Bolívar: región de Canaima, entre el hotel y el Salto Hacha, 6°15′N, 62°47′W, 400 m, 18 July 1972, *J. A. Steyermark 106343* (holotype, MO-5104409!).

Habitat and distribution. This species is only known from the type collection from eastern Venezuela (Bolívar), and its habitat vegetation type is unknown (Gentry, 1997).

37. Amphilophium perbracteatum A. H. Gentry, Phytologia 57(3): 241. 1985. TYPE: Brazil. Bahia: Serra Geral de Caitité, 9 km S of Brejinhos das Ametistas, 14°19′S, 42°27′W, 900 m, 12 Apr. 1980, *R. M. Harley, G. L. Bromley, A. M. de Carvalho, J. L. Hage & H. S. Brito 21286* (holotype, CEPEC not seen; isotypes, K!, MO-2918680!, MO-3520342!).

Habitat and distribution. This species is only known from the type collection from tall deciduous forest vegetation in eastern Brazil (Bahia).

38. Amphilophium pilosum Standl., Field Mus. Nat. Hist., Bot. Ser. 17(4): 392. 1938, as "*Amphilopium.*" TYPE: Honduras. Comayagua: along river bank on plains near Siguatepeque, 1050 m, 25 July 1936, *T. G. Yuncker, R. F. Dawson & H. R. Youse 6683* (holotype, F-873360 image!, F as unnumbered photo at MO-1183683!; isotype, MO-1167116!).

Habitat and distribution. This species is known from wet forest vegetation in Honduras.

39. Amphilophium porphyrotrichum (Sandwith) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 271. 2008. *Distictella porphyrotricha* Sandwith, Bol. Soc. Venez. Ci. Nat. 25(106): 48. 1963. TYPE: Venezuela. Bolívar: vic. Km. 135 S of El Dorado, NE of Luepa, in drainage of Río Cuyuni, 800–1200 m, 6–11 Mar. 1962, *J. A. Steyermark & L. Aristeguieta 98* (holotype, K!; isotypes, NY-328779!, US-2430090 image!).

Habitat and distribution. This species is known from wet premontane forest vegetation at 800–1380 m (Pool, 2009) in Venezuela (Bolívar), Brazil (Amapá), and perhaps Guyana.

40. Amphilophium pulverulentum (Sandwith) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 271. 2008. *Distictella pulverulenta* Sandwith, Brittonia 3(2): 91. 1938. *Distictis pulverulenta* (Sandwith) A. H. Gentry, Ann. Missouri Bot. Gard.

63(1): 77. 1976. TYPE: Brazil. Amazonas: basin of Rio Solimões, São Paulo de Olivença, basin of creek Belém, 26 Oct.–11 Dec. 1936, *B. A. Krukoff 8685* (holotype, NY-328780!; isotypes, BM-603417!, BR!, F-929820 image!, GH not seen, K!, MO-1261554!, P [barcode] P00468596!, U not seen).

Habitat and distribution. This species is found in non-inundated lowland forest and disturbed vegetation, often on white sand substrates, in Colombia (Amazonas, Caquetá, Vaupés), Venezuela (Amazonas, Bolívar), Guyana, Suriname, French Guiana, Peru (Loreto, San Martín), and Brazil (Amazonas).

41. Amphilophium racemosum (Bureau & K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Distictis racemosa* Bureau & K. Schum., Fl. Bras. 8(2): 179. 1896. *Distictella racemosa* (Bureau & K. Schum.) Urb., Repert. Spec. Nov. Regni Veg. 14: 310. 1916. TYPE: Suriname. Wanica River, s.d., *H. R. Wullschlaegel 1033* (lectotype, designated by Pool [2009: 315], BR-880400 not seen).

Habitat and distribution. Pool (2009) circumscribed this species differently than done by previous authors, who have considered it a synonym of *Distictella magnoliifolia*. In her new circumscription, followed here, *Amphilophium racemosum* is found in wet forest vegetation in Colombia (Amazonas, Antioquia, Caquetá, Chocó, Santander, Vaupés), Venezuela (Amazonas, Bolívar, Delta Amacuro, Sucre), Guyana, Suriname, French Guiana, Ecuador, Peru (Amazonas, Junín, Loreto, Madre de Dios, Puno, San Martín), Bolivia, and Brazil (Amazonas, Mato Grosso, Pará, Rôndonia, Roraima).

42. Amphilophium reticulatum (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Distictella reticulata* A. H. Gentry, Ann. Missouri Bot. Gard. 65(2): 728. 1978 [1979]. *Amphilophium reticulatum* (A. H. Gentry) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 761. 2010, nom. nud. invalid. TYPE: Brazil. Amazonas: Manaus, Igarapé da Cachoeira Alta do Tarumã, 28 Aug. 1962, *W. Rodrigues & J. Chagas 4610* (holotype, INPA not seen; isotype, MO-2228017!).

Habitat and distribution. This species is known from campinas and riverside vegetation, generally on white sand substrates, in the central Amazon basin near Manaus, Brazil (Amazonas).

43. Amphilophium rodriguesii (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Haplolophium rodriguesii* A. H. Gentry, Ann. Missouri Bot. Gard. 63(1): 53, fig. 2. 1976. *Amphilophium rodriguesii* (A. H. Gentry) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 761. 2010, nom. nud. invalid. TYPE: Brazil. Amazonas: Manaus, rd. to Igarapé do Passarinho, 22 May 1962, *W. Rodrigues & J. Chagas 4460* (holotype, INPA not seen; isotypes, MO-2232870!, NY-328855!).

Habitat and distribution. This species is found in wet forest vegetation in Panama, Colombia (Amazonas, Córdoba), French Guiana, Bolivia, and Brazil (Amazonas, Pará).

44. Amphilophium sandwithii Fabris, Darwiniana 13(2–4): 456, fig. 3. 1964. TYPE: Argentina. Jujuy: Santa Bárbara, El Fuerte, 1700 m, *H. A. Fabris 5103* (holotype, SI not seen).

Habitat and distribution. This species is found in humid forest vegetation at 1500–2500 m in Bolivia and Argentina (Jujuy, Salta).

45. Amphilophium scabriusculum (Mart. ex DC.) L. G. Lohmann, comb. nov. Basionym: *Pithecoctenium scabriusculum* Mart. ex DC., in A. DC., Prodr. 9: 197. 1845. *Distictis scabriuscula* (Mart. ex DC.) A. H. Gentry, Ann. Missouri Bot. Gard. 61(2): 499. 1974. *Amphilophium scabriusculum* (Mart. ex DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 761. 2010, nom. nud. invalid. TYPE: Brazil. Paraíba: Rio Paraíba, 1826, *Prince Videnses (Wied-Neuwied) s.n.* (holotype, BR-802423!).

Habitat and distribution. This species is found in Atlantic forest vegetation in Brazil (Bahia, Espírito Santo, Minas Gerais, Paraíba, and Pernambuco).

46. Amphilophium stamineum (Lam.) L. G. Lohmann, comb. nov. Basionym: *Bignonia staminea* Lam., Encycl. 1: 421. 1785. *Wunschmannia staminea* (Lam.) Urb., Symb. Antill. 5: 494. 1908. *Distictis staminea* (Lam.) A. H. Gentry, Ann. Missouri Bot. Gard. 61(2): 497. 1974. TYPE: Plumier, Pl. Amer. tab. 56, fig. 2, 1756 (lectotype, designated by de Candolle [1845: 161]).

Habitat and distribution. This species is found in lowland dry forest vegetation in the Greater Antilles, on the island of Hispaniola (Dominican Republic, Haiti).

47. Amphilophium steyermarkii (A. H. Gentry) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 271. 2008. *Distictis steyermarkii* A. H. Gentry, Ann. Missouri Bot. Gard. 61(2): 499. 1974.

TYPE: Venezuela. Distrito Federal: betw. Osma & Todasana, 100 m, 24 Nov. 1971, *J. A. Steyermark & C. B. Carias 105274* (holotype, MO-5104410!; isotypes, MO-2102596!, VEN not seen).

Habitat and distribution. This species is found in deciduous forest vegetation in Colombia (César, Norte de Santander) and Venezuela (Distrito Federal, Miranda, Táchira, Trujillo, Zulia).

III. Anemopaegma Mart. ex Meisn., Pl. Vasc. Gen. 1: 300, 2: 208. 1840, as "*Anemopaegmia*," nom. & orth. cons. TYPE: *Anemopaegma mirandum* (Cham.) Mart. ex DC. [= *Anemopaegma arvense* (Vell.) Stellfeld ex J. F. Souza].

Cupulissa Raf., Fl. Tellur. 2: 57. 1836 [1837], nom. rej. vs. *Anemopaegma* Mart. ex Meisn. TYPE: *Cupulissa grandifolia* (Jacq.) Raf. [≡ *Anemopaegma grandifolium* (Jacq.) Merr. & Sandwith].

Platolaria Raf., Sylva Tellur. 78. 1838, nom. rej. vs. *Anemopaegma* Mart. ex Meisn. TYPE: *Platolaria flavescens* Raf., nom. illeg. superfl. [= *Anemopaegma orbiculatum* (Jacq.) A. DC.].

Pseudopaegma Urb., Ber. Deutsch. Bot. Ges. 34: 739. 1916. TYPE: *Pseudopaegma juncundum* (Bureau & K. Schum.) Urb. (lectotype, designated by Sandwith [1962: 453]) [≡ *Anemopaegma juncundum* Bureau & K. Schum.].

Shrubs or lianas, without dimorphic juvenile growth, without strong odor; stems with phloem wedges in multiples of 4 in cross-section, pith solid; branchlets cylindrical, glabrous to pubescent, with sparsely to densely distributed lenticels, without (with) interpetiolar gland fields, with discontinuous interpetiolar ridge, with epidermis not peeling; prophylls of axillary buds elliptic and foliaceous or minute and triangular, with glands. Leaves 2- or 3-(or 5-)foliolate, terminal leaflet often replaced by a trifid (simple) tendril, tendrils without adhesive disks, without uncinate apices; leaflets chartaceous or coriaceous, with glands grouped in axils of veins or sparsely distributed over lamina, without pellucid punctations, without domatia, petiolules not articulated; petiole cylindrical, never modified into a tendril, not articulated. Inflorescence axillary, a raceme, fascicle, cyme, or compound thyrse. Flowers zygomorphic, pentamerous; calyx cupular, shortly (deeply) 5-lobed or truncate, membranaceous or coriaceous, glabrous to villose externally, without glands or with glands clustered near margins; corolla yellow (white or red), infundibuliform, straight in tube, membranaceous, puberulous (villose) externally, with nectar guides, with glands arranged in lines on upper portion of tube, lobes 5, imbricate; stamens 4, with well-developed filaments, included, anthers glabrous, thecae straight, pollen in monads, colpate, with exine reticulate; ovary stipitate, smooth and lepidote externally, ovules in multiple series on each placenta, stigma rhombic, glabrous; disk annular. Capsules elliptic and stipitate, flattened, straight, coriaceous, with valves 2, glabrous (pubescent), without lenticels, without glands, without wings, smooth, with calyx persistent; seeds winged or not, with body smooth and glabrous, wings hyaline or opaque, linear. Figure 9.

Number of species, distribution, and habitat. *Anemopaegma* includes 45 species found in wet to dry forest, savanna, and dry caatinga vegetation from Mexico to Argentina and southern Brazil.

Anemopaegma is highly supported (100%) as monophyletic in the phylogenetic hypothesis of Bignonieae (Lohmann, 2006; Fig. 2), and is well characterized by its generally racemose inflorescences with yellow flowers and glands at the base of the corolla lobes, a glandular calyx, and a stipitate ovary and fruit (Fig. 9D, E; the last two characters are synapomorphies of the genus). Vegetatively, *Anemopaegma* is characterized by cylindrical stems, prophylls of the axillary buds that are foliaceous and elliptic to somewhat orbicular or heart-shaped, the frequent presence of glands in the axils of the secondary veins of leaflets, and trifid tendrils. The genus predominantly has yellow bee-pollinated flowers, with only *A. ionanthum* A. H. Gentry having red flowers and known to be hummingbird-pollinated (Gentry, 1985).

1. Anemopaegma acutifolium DC., in A. DC., Prodr. 9: 188. 1845. TYPE: Brazil. Mato Grosso: s. loc., 1833, *C. Gaudichaud 97* (holotype, P!, P as photo F neg. 39942 at F!; isotypes, G-DC!, R not seen).

Habitat and distribution. This species is found in dry forest and cerrado vegetation in Bolivia and Brazil (Bahia, Distrito Federal, Goiás, Mato Grosso, São Paulo).

2. Anemopaegma alatum A. H. Gentry, Ann. Missouri Bot. Gard. 63(1): 67. 1976. TYPE: Venezuela. Sucre: betw. La Sabana, Los Altos & La Silleta, towards Zurita, 600 m, 18 Aug. 1973, *J. A. Steyermark, V. Carreño Espinoza & B. J. Manara 107753* (holotype, MO-2133145!; isotype, VEN not seen).

Habitat and distribution. This species is found in evergreen lowland and lower montane forest vegetation (Gentry, 1997) in Colombia (Vaupés) and Venezuela (Bolívar, Monagas, Sucre).

3. Anemopaegma album Mart. ex DC., in A. DC., Prodr. 9: 188. 1945. TYPE: Brazil. Minas

Gerais: Contendas, Diamantina [sub Tejuco] at Formigas, Aug. 1818, *C. F. P. von Martius 1553* (lectotype, designated here, M-86292!, M as photo F neg. 20452 at MO-1692833!; isolectotypes, G-DC!, M-86293!, M-86293!, M-86295!, M-86294!).

Nomenclatural note. The name *Anemopaegma album* was published simultaneously with *A. quinquedentatum* Mart. ex DC., and these are today considered synonyms; these names were first synonymized by Bureau and Schumann (1896), who chose the first name. Original material of *A. album* is deposited at M, where there are five duplicates of the type. The best material is here chosen as the lectotype.

Habitat and distribution. This species is found in cerrado and carrasco vegetation in eastern Brazil (Bahia, Ceará, Minas Gerais).

4. Anemopaegma arvense (Vell.) Stellfeld ex J. F. Souza, Tribuna Farm. 13: 275. 1945. *Bignonia arvensis* Vell., Fl. Flumin. 250. 1825 [1829]; Fl. Flumin. Icon. 6: tab. 40. 1827 [1831]. *Jacaranda arvensis* (Vell.) Steud., Nomencl. Bot., ed. 2, 1: 795. 1840. TYPE: tab. 40 in Vellozo, Fl. Flumin. Icon. 6, 1827 [1831] (lectotype, designated here).

Habitat and distribution. This species is found in cerrado vegetation in Bolivia, Paraguay, and Brazil (Bahia, Ceará, Distrito Federal, Maranhão, Mato Grosso, Paraná, Rôndonia).

5. Anemopaegma brevipes S. Moore, Trans. Linn. Soc. London, Bot. 4: 420. 1895. TYPE: Brazil. Mato Grosso do Sul: close to Corumbá, *S. Moore 1009* (holotype, BM not seen; isotype, NY-313061!).

Habitat and distribution. This species is found in dry forest vegetation in central Brazil (Goiás, Mato Grosso do Sul).

6. Anemopaegma chamberlaynii (Sims) Bureau & K. Schum., Fl. Bras. 8(2): 128. 1896, as "*chaimberlaynii.*" *Bignonia chamberlaynii* Sims, Bot. Mag. 47: tab. 2148. 1820. *Bignonia aequinoctialis* var. *chamberlaynii* (Sims) Ker Gawl., Bot. Reg. 9: tab. 741. 1823. TYPE: tab. 2148 in Sims, Bot. Mag. 47, 1820 (lectotype, designated here).

Anemopaegma scandens (Vell.) Corr. Méllo ex K. Schum., Nat. Pflanzenfam. 4(3b): 215. 1894. *Bignonia scandens* Vell., Fl. Flum. 246. 1825 [1829]; Fl. Flum. Icon. 6: tab. 22. 1827 [1831]. TYPE: tab. 22 in Vellozo, Fl. Flum. Icon. 6, 1827 [1831] (lectotype, designated here).

Nomenclatural note. Sims did not make any reference to a type at the time of publication of *Bignonia chamberlaynii.* No corresponding material has been located, and the illustration presented in Sims' publication is here chosen as the lectotype.

Habitat and distribution. This species is found in dry to wet forest vegetation in Bolivia, Paraguay, and Brazil (Bahia, Ceará, Distrito Federal, Espírito Santo, Mato Grosso do Sul, Minas Gerais, Paraná, Piauí, Rio de Janeiro, São Paulo).

7. Anemopaegma chrysanthum Dugand, Caldasia 4(19): 307. 1947. TYPE: Colombia. Cauca: costa del Pacífico, río Micay, brazo Noanamito, orilla derecha, El Chachajo, 2–5 m, 27 Feb. 1943, *J. Cuatrecasas 14269* (holotype, COL-16368 image!; isotypes, F-1336989 image!, US-2817237 image!).

Habitat and distribution. This species is found in wet to dry lowland forest vegetation in Mexico (Chiapas, Oaxaca, Tabasco, Veracruz), Belize, El Salvador, Nicaragua, Costa Rica, Panama, Colombia (Antioquia, Cauca, Chocó, Cundinamarca, Nariño, Quindio, Risaralda, Valle del Cauca), Ecuador, and Peru (Cajamarca, Loreto, Piura, Tumbes).

8. Anemopaegma chrysoleucum (Kunth) Sandwith, Lilloa 3: 459. 1938. *Bignonia chrysoleuca* Kunth, Nov. Gen. Sp. 3: 134. 1818 [1819]. TYPE: Colombia. Bolívar: Río Magdalena, betw. Río Viego [sic] & Bojorque, May, s.d., *F. W. H. A. von Humboldt & A. J. A. Bonpland 1576* (holotype, P-Bonpl.!, P-Bonpl. as photo F neg. 339411 at MO-1692922!).

Habitat and distribution. This species with water-dispersed seeds is found in humid lowland forests, often on riversides (Gentry, 1997), in Mexico (Veracruz), Belize, Guatemala, Honduras, Costa Rica, Nicaragua, Panama, Colombia (Amazonas, Antioquia, Atlántico, Bolívar, Caquetá, Cauca, César, Chocó, Córdoba, Guianía, Magdalena, Meta, Nariño, Putumayo, Valle del Cauca, Vaupés, Vichada), Venezuela (Amazonas, Apure, Barinas, Bolívar, Delta Amacuro, Táchira, Zulia), Trinidad and Tobago, Guyana, Suriname, Ecuador, Peru (Amazonas, Loreto, Madre de Dios, San Martín, Ucayali), Bolivia, and Brazil (Amazonas, Pará).

9. Anemopaegma citrinum Mart. ex DC., in A. DC., Prodr. 9: 189. 1845. TYPE: Brazil. s. loc., s.d., *C. F. P. von Martius s.n.* (lectotype, designated

here, BR-880372!; isolectotypes, BR-880339!, BR-880307!, BR-880303!, BR-880336!).

Nomenclatural note. Part of Martius' herbarium has been transferred to BR; therefore, the specimens there represent original material. There are five duplicates of the type material of this species at BR, and the best material is here chosen as the lectotype.

Habitat and distribution. This species is found in dry forest, carrasco, and cerrado vegetation in eastern Bolivia and Brazil (Bahia, Maranhão, Minas Gerais, Paraiba, Piauí).

10. Anemopaegma colombianum (Sandwith) A. H. Gentry, Ann. Missouri Bot. Gard. 63(1): 67. 1976. *Pseudopaegma colombianum* Sandwith, Kew Bull. 8(4): 473. 1953 [1954]. TYPE: Colombia. Meta: Villavicencio, Los Llanos, towards El Parrao, 500 m, 10 Nov. 1938, *J. Cuatrecasas 4605* (lectotype, designated here, COL-24928 image!, COL as photo K. neg. 2007 at K!; isolectotype, US-1773513 image!).

Nomenclatural note. Two syntypes were cited in the protologue of this name, *Cuatrecasas 4605* and *Romero-Castañeda 1513*. Both collections are deposited at COL. The collection *Cuatrecasas 4605* has been photographed by K and the photos distributed for reference, thus this is here selected as the lectotype.

Habitat and distribution. This species is found, apparently infrequently, in wet forest vegetation in Colombia (Antioquia, Meta) and Peru (Loreto, Pasco).

11. Anemopaegma flavum Morong, Ann. New York Acad. Sci 7: 188. 1892. TYPE: Paraguay. On hwy. from Villa Rica to Escoba, 30 Jan. 1889, *T. Morong 567* (holotype, NY-313063!).

Habitat and distribution. This species is found in dry forest vegetation in Peru (Madre de Dios), Bolivia, Paraguay, and Argentina (Chaco, Corrientes, Formosa, Santa Fe).

12. Anemopaegma floridum Mart. ex DC., in A. DC., Prodr. 9: 188. 1845. TYPE: Brazil. Amazonas: Rio Negro, Rio Japurá, s.d., *C. F. P. von Martius s.n.* (holotype, M-86304!, M as photo F neg. 20453 at MO-1692835! and at INPA!; isotype, M-86305!).

Habitat and distribution. This species is found in evergreen lowland forest vegetation (Gentry, 1997) in Colombia (Amazonas, Caquetá, Vaupés), Venezuela (Amazonas), Ecuador, Peru (Loreto, Madre de Dios), Bolivia, and Brazil (Acre, Amazonas, Bahia, Espírito Santo, Maranhão, Mato Grosso, Minas Gerais, Piauí, Rio de Janeiro, Rôndonia).

13. Anemopaegma foetidum Bureau & K. Schum, Fl. Bras. 8(2): 143. 1896. TYPE: Brazil. Amazonas: Alto Amazonas, Manaus, 20 Apr. 1882, *C. Schwacke 3620* (holotype, B†, B as photo F neg. 18454 at MO-1692836!).

Nomenclatural note. The type of this species was deposited at B and subsequently was destroyed, and no isotypes have so far been located. Ongoing monographic work will clarify the typification of this species (Firetti-Leggieri & Lohmann, in prep.).

Habitat and distribution. This species is found in wet forest and campinarana vegetation in Colombia (Vaupés), Guyana, Suriname, and Brazil (Amazonas, Pará).

14. Anemopaegma glaucum Mart. ex DC., in A. DC., Prodr. 9: 188. 1845. TYPE: Brazil. Minas Gerais: close to Chapada of Paranan, "in Taboleiro ao fl. Formoso," Sep. 1818, *C. F. P. von Martius 1823* (lectotype, designated here, M-86307!; isolectotypes, G-DC!, G-DC as photo F neg. 7664 at MO-1692837!, M-86309!, M-86308!).

Nomenclatural note. The names *Anemopaegma glaucum* and *A. lanceifolium* DC. were published simultaneously and are today considered synonyms. These were first synonymized by Bureau and Schumann (1896), who chose the name *A. glaucum*. Original material of *A. glaucum* is deposited at M, where there are four duplicates of the type collection. The best material is here chosen as the lectotype.

Habitat and distribution. This species is found in cerrado vegetation in Bolivia, Paraguay, and Brazil (Bahia, Distrito Federal, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, São Paulo).

15. Anemopaegma goyazense K. Schum., Fl. Bras. 8(2): 407. 1896 [1897]. TYPE: Brazil. Goiás: Fazenda da Bolívia, 1894–1895, *A. Glaziou 21846* (holotype, B†, B as photo F neg. 18455 at MO-1692838!; lectotype, designated here, K [barcode] K000449381!; isolectotypes, BR-880306!, F-998948 image!, F-998948 as photo F neg. 18455 at INPA!, G-14111!).

Nomenclatural note. The type of this species was apparently destroyed at B, and no material was found

at P where Bureau worked. The isotype seen with the best material is here designated as the lectotype.

Habitat and distribution. This species is found, apparently infrequently, in cerrado and dry carrasco vegetation in east-central Brazil (Bahia, Goiás, Minas Gerais).

16. Anemopaegma gracile Bureau & K. Schum., Fl. Bras. 8(2): 132. 1896. TYPE: Brazil. Rio de Janeiro: Nova Friburgo, Alto da Boa Vista, 22 Mar. 1880, *A. Glaziou 12999* (holotype, P [barcode] P00468583!, P as photocopy at MO-2294617!; isotype, K!, K as photocopy at MO-2904350!).

Habitat and distribution. This species is found infrequently in dry to wet forest vegetation in east-central Brazil (Distrito Federal, Goiás, Minas Gerais, Rio de Janeiro) and in northeastern Brazil (Pernambuco).

17. Anemopaegma grandifolium (Jacq.) Merr. & Sandwith, J. Arnold Arbor. 28: 432. 1947. *Bignonia grandifolia* Jacq., Pl. Hort. Schoenbr. 3: 19, tab. 287. 1789. *Cupulissa grandifolia* (Jacq.) Raf., Fl. Tellur. 2: 57. 1836 [1837]. TYPE: tab. 287 in Jacquin, Pl. Hort. Schoenbr. 3: 1789 (lectotype, designated here).

Habitat and distribution. This species is found in humid evergreen vegetation in northern Venezuela (Distrito Federal, Mérida, Miranda).

18. Anemopaegma granvillei A. H. Gentry, Ann. Missouri Bot. Gard. 64(2): 311. 1977 [1978]. TYPE: French Guiana. Rivière Petite Ouaqui vers l'embouchere de la crique Carbet Brûle, 27 July 1973, *J. J. de Granville 1935* (holotype, CAY not seen; isotypes, CAY not seen, MO-2665614!).

Habitat and distribution. This species is only known from the type specimen, from wet forest vegetation in southern French Guiana.

19. Anemopaegma heringeri J. C. Gomes, Arch. Jard. Bot. Rio de Janeiro 12: 147. 1953. TYPE: Brazil. Minas Gerais: Coronel Pacheco, Estação Experimental, 3 Dec. 1942, *E. P. Heringer 1147* (holotype, RB-76935 [barcode] 642332!; isotype, MO-2192050!, RB-76935 [barcode] 284908!).

Habitat and distribution. This species is known from dry forest vegetation in southeastern Brazil (Minas Gerais).

20. Anemopaegma hilarianum Bureau & K. Schum., Fl. Bras. 8(2): 124, tab. 80. 1896. TYPE: Brazil. Rio de Janeiro: Petrópolis, 19 Jan. 1876, *A. Glaziou 4105* (holotype, P [barcode] P00468585!, P as photocopy at MO-2294581!; isotypes, C not seen, C as photo F neg. 22139 at MO-1692839!).

Habitat and distribution. This species is found in forest vegetation in southeastern Brazil (Bahia, Goiás, Minas Gerais, Rio de Janeiro).

21. Anemopaegma insculptum (Sandwith) A. H. Gentry, Ann. Missouri Bot. Gard. 63(1): 67. 1976. *Pseudopaegma insculptum* Sandwith, Kew Bull. 9: 608. 1954 [1955]. TYPE: Colombia. Amazonas: Río Caquetá, La Pedrera, 240 m, 1–4 Oct. 1952, *H. García-Barriga 14617* (holotype, K!; isotypes, COL-407593 image!, MO-04922799!, US-2144508 image!, US-3362853 image!).

Habitat and distribution. This species is found in wet forest vegetation in Colombia (Amazonas), Peru (Madre de Dios, Puno), Bolivia, and Brazil (Amazonas, Rôndonia).

22. Anemopaegma ionanthum A. H. Gentry, Phytologia 57(3): 242. 1985. TYPE: French Guiana. Nord: Massif des Emerillons, 300 m, 20 Sep. 1980, *G. Cremers 6737* (holotype, MO-2887201!; isotype, CAY not seen).

Habitat and distribution. This species is found in wet forest vegetation in Guyana, French Guiana, and northern Brazil (Amapá, Amazonas, Pará).

23. Anemopaegma jucundum Bureau & K. Schum., Fl. Bras. 8(2): 144. 1896. *Pseudopaegma jucundum* (Bureau & K. Schum.) Urb., Ber. Deutsch. Bot. Ges. 34: 740. 1916. TYPE: British Guiana [Guyana]. Rio Branco, Oct., *M. Rob. Schomburgk ser. I, 877* (lectotype, designated here, G-8918!; isolectotypes, G-8902!, K!, P [barcode] P00468593!).

Nomenclatural note. Two syntypes were cited in the protologue, *Rob. Schomburgk ser. I, 877* and *Ayres s.n.* The collection *Ayres s.n.* was not located during this study. The *Schomburgk ser. I, 877* collection matches the original description and is represented by several duplicates, and is here designated as the type; the specimen at G is selected as the lectotype because it has the best material.

Habitat and distribution. This species is found in evergreen lowland forest vegetation (Gentry, 1997) in

Venezuela (Amazonas, Bolívar), Guyana, and Brazil (Amazonas, Roraima).

24. Anemopaegma karstenii Bureau & K. Schum., Fl. Bras. 8(2): 130. 1896, as "Karstenii." TYPE: Venezuela. Carabobo: close to Puerto Caballo, s.d., *H. Karsten s.n.* (presumed holotype, B†).

Nomenclatural note. The holotype specimen is presumed to have been at B and now destroyed; no specimens of this species collected by Karsten were found at P. A broad search of other herbaria, including W, is currently being conducted for Karsten material of this species so the typification can be clarified (Firetti-Leggieri & Lohmann, in prep.).

Habitat and distribution. This species is found in evergreen lowland to montane vegetation (Gentry, 1997) in Colombia (Antioquia, Caquetá, Magdalena, Norte de Santander, Santander, Tolima, Vichada), Venezuela (Amazonas, Anzoátegui, Aragua, Barinas, Bolívar, Carabobo, Delta Amacuro, Distrito Federal, Falcón Lara, Mérida, Miranda, Monagas, Portuguesa, Sucre, Táchira, Yaracuy, Zulia), Trinidad and Tobago, Guyana, and northern Brazil (Roraima).

25. Anemopaegma laeve DC., in A. DC., Prodr. 9: 189. 1845. TYPE: Brazil. Bahia: Jacobina, Marais de Japira, Vila da Barra, 1840, *J. S. Blanchet 3102* (holotype, G-DC!, G-DC as photo F neg. 7663 at MO-1692840!; isotypes, G-8920!, G-14117!, K!, P [barcode] P00468584!, P as photocopy at MO-2294580!).

Habitat and distribution. This species is found in dry caatinga and carrasco vegetation in eastern Brazil (Bahia, Ceará, Maranhão, Minas Gerais, Paraíba, Pernambuco, Piauí).

26. Anemopaegma longidens Mart. ex DC., in A. DC., Prodr. 9: 190. 1845. *Pseudopaegma longidens* (Mart. ex DC.) Urb., Ber. Deutsch. Bot. Ges. 34: 740. 1916. TYPE: Brazil. Pará: Rio Amazonas, s.d., *C. F. P. von Martius s.n.* (holotype, M-86313!, M as photo F neg. 20454 at MO-1692841!; isotype, G-DC!).

Habitat and distribution. This species is found in humid vegetation in French Guiana and Brazil (Amazonas, Goiás, Mato Grosso, Pará, Tocantins).

27. Anemopaegma longipetiolatum Sprague, Bull. Herb. Boissier, sér. 2, 5: 82. 1905. TYPE: Paraguay. Rio Apa, Nov. 1901–1902, *E. Hassler 7949* (holotype, G-14113!, G-DC as photo F neg. 26182 at MO-1185280! and MO-1692842!; isotypes, K!, MO-2187734!, MO-1573950!, NY-313068!, NY-313069!, P [barcode] P00468588!, P [barcode] P00468589!, P [barcode] P00468590!, US-2055320 image!).

Habitat and distribution. This species is found in dry forest vegetation in eastern Bolivia, Paraguay, and Brazil (Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará).

28. Anemopaegma mirabile (Sandwith) A. H. Gentry, Ann. Missouri Bot. Gard. 63(1): 67. 1976. *Pseudopaegma mirabile* Sandwith, Kew Bull. 8(4): 474. 1953 [1954]. TYPE: Brazil. Piauí: banks of Gurgueia, Aug. 1839, *G. Gardner 2679* (holotype, K!; isotype, BM!).

Habitat and distribution. This species is found in dry forest vegetation in northern Brazil (Maranhão, Piauí).

29. Anemopaegma oligoneuron (Sprague & Sandwith) A. H. Gentry, Ann. Missouri Bot. Gard. 63(1): 67, fig. 6. 1976. *Pseudopaegma oligoneuron* Sprague & Sandwith, Bull. Misc. Inform. Kew 1932: 88. 1932. TYPE: British Guiana [Guyana]. Upper Demerara River, Sep. 1887, *G. S. Jenman 4070* (holotype, K!).

Habitat and distribution. This species is found in evergreen lowland forest vegetation (Gentry, 1997) in Colombia (Amazonas, Caquetá, Meta, Vichada), Venezuela (Amazonas, Bolívar), Guyana, French Guiana, Ecuador, Peru (Loreto), and Brazil (Acre, Amazonas, Maranhão, Pará).

30. Anemopaegma orbiculatum (Jacq.) A. DC., Prodr. 9: 190. 1845. *Bignonia orbiculata* Jacq., Enum. Syst. Pl. 25. 1760. *Jacaranda orbiculata* (Jacq.) Spreng., Syst. Veg. 2: 834. 1825. *Platolaria flavescens* Raf., Sylva Tellur. 78. 1838, nom. illeg. superfl. *Peltospermum orbiculatum* (Jacq.) DC. ex Meisn., Pl. Vasc. Gen. 208. 1840. TYPE: Colombia. Magdalena: Cartagena, Sep.–Oct., *N. J. Jacquin s.n.* (holotype, W!, W as photo F neg. 32845 image!).

Habitat and distribution. This species is found in evergreen forest vegetation in Mexico (Chiapas), El Salvador, Nicaragua, Costa Rica, Panama, Colombia (Atlántico, Bolívar, Chocó, Magdalena, Santander, Sucre, Tolima), and western Venezuela (Zulia).

31. Anemopaegma pabstii A. H. Gentry, Phytologia 46(4): 201. 1980. TYPE: Brazil. Bahia: BR-4, Km. 968, 16 Jan. 1965, *E. Pereira 9482 & G. Pabst 8371* (holotype, HB not seen; isotype, MO-2692230!).

Habitat and distribution. This species is found in cerrado vegetation in east-central Brazil (Bahia, Ceará, Goiás, Maranhão, Minas Gerais, Pará, Piauí, Tocantins).

32. Anemopaegma pachyphyllum Bureau & K. Schum., Fl. Bras. 8(2): 126. 1896. TYPE: Brazil. São Paulo, betw. São José dos Barreiros & Formosa, 10 July 1849, *A. Glaziou 11592* (holotype, P!, P as photocopy at MO-2294579!; isotype, C not seen, C as photo F neg. 22140 at MO-1692844!).

Habitat and distribution. This species is found in cerrado vegetation in central to southeastern Brazil (Bahia, Goiás, Maranhão, Pará, Piauí, São Paulo, Tocantins).

33. Anemopaegma paraense Bureau & K. Schum., Fl. Bras. 8(2): 131. 1896. TYPE: Brazil: Pará, close to Santarém, Mar. 1850, *R. Spruce 718* (lectotype, designated here, G-8919!; isolectotypes, G-14119!, G [unnumbered, 2 sheets]!, M-86314!, M-86314 as photo F neg. 20455 at MO-1692845!).

Nomenclatural note. Three syntype collections were cited in the protologue, *Martius s.n.*, *Poeppig 2896*, and *Spruce 718*. The collection *Poeppig 2896* was apparently deposited at B and later destroyed, and no duplicates have yet been located. The specimens collected by Martius were seen at M (M-86315!, M-83316!), and several duplicates of the Spruce collection were located. Spruce's collection includes the highest number of duplicates and the best quality material, and is chosen as the type; the best specimen of this set was selected as the lectotype.

Habitat and distribution. This species is known from swampy and riverside forest vegetation (Gentry, 1997) in Colombia (Amazonas, Vaupés), Venezuela (Bolívar, Delta Amacuro), Guyana, Suriname, French Guiana, Ecuador, Peru (Amazonas, Loreto, Ucayali), Bolivia, and Brazil (Acre, Amapá, Amazonas, Pará).

34. Anemopaegma parkeri Sprague, Bull. Herb. Boissier, sér. 2, 6: 375. 1906. TYPE: British Guiana [Guyana]. Demerara River, s.d., *W. Parker s.n.* (lectotype, designated here, K!).

Nomenclatural note. Three syntypes were listed by Sprague in the protologue: *Went 128*, *Went 377*, and *Parker s.n.* Only the Parker specimen was located at K where he worked, and this is here designated as the lectotype.

Habitat and distribution. This species is found in lowland to montane evergreen forest vegetation (Gentry, 1997) in Venezuela (Amazonas, Bolívar), Guyana, Suriname, French Guiana, Bolivia, and Brazil (Amazonas, Ceará, Maranhão, Pará, Paraíba, Piauí, Rondônia, Roraima).

35. Anemopaegma patelliforme A. H. Gentry, Ann. Missouri Bot. Gard. 63(1): 69. 1976. TYPE: Venezuela. Amazonas: Mavacá, Alto Orinoco, Yanomami Indians, Jan. 1970, *L. Aristeguieta & J. Lizot 7374* (holotype, VEN not seen, VEN as photocopy at MO-2251981!).

Habitat and distribution. This species is found in wet forest vegetation, often along streams (Gentry, 1997), in Venezuela (Amazonas, Bolívar), Bolivia, and Brazil (Mato Grosso).

36. Anemopaegma prostratum DC., in A. DC., Prodr. 9: 189. 1845. TYPE: Brazil. São Paulo: São José, Nov. 1835, *P. W. Lund 787* (lectotype, G-DC!, G-DC as photo F neg. 7662 at MO-1692747!; isolectotype, BR-880401!).

Nomenclatural note. De Candolle cited two collections in the protologue, *Lund s.n.* and *Guillemin s.n.*; the Lund specimen has a collection number on its label, and is here chosen as the lectotype.

Habitat and distribution. This species is found in seasonal and Altantic forest vegetation in Bolivia and Brazil (Bahia, Espírito Santo, Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina, São Paulo).

37. Anemopaegma puberulum (Seibert) Miranda, Anales Inst. Biol. Nac. México 24(1): 93. 1953. *Chodanthus puberulus* Seibert, Publ. Carnegie Inst. Wash. 522: 425, tab. 7. 1940. TYPE: Mexico. Chiapas: s. loc., 17 May 1904, *E. A. Goldman 999* (holotype, US-470794 image!).

Habitat and distribution. This species is found in wet to seasonal forest vegetation in Mexico (Chiapas, Oaxaca, Veracruz), Guatemala, El Salvador, Honduras, Costa Rica, Panama, western Colombia (Cauca, Valle del Cauca), western Ecuador, and northwestern Peru (Piura, Tumbes).

38. Anemopaegma robustum Bureau & K. Schum., Fl. Bras. 8(2): 123. 1896. TYPE: British Guiana [Guyana]. River Essequibo, s.d., *Rich. H. Schomburgk 355* (presumed holotype, B†).

Nomenclatural note. No type material of this name has yet been located. An ongoing taxonomic

revision of this genus will clarify the typification of this species (Firetti-Leggieri & Lohmann, in prep.).

Habitat and distribution. This species is found in humid lowland forest vegetation in Venezuela (Amazonas, Bolívar), Guyana, French Guiana, Brazil (Amazonas), and possibly northeastern Peru (Loreto; Gentry, 1997).

39. Anemopaegma rugosum (Schltdl.) Sprague, Bull. Misc. Inform. Kew 1931: 233. 1931. *Bignonia rugosa* Schltdl., Linnaea 26: 856. 1854. TYPE: Venezuela. Miranda: Chacao, s.d., *Wagener 437* (holotype, HAL not seen).

Habitat and distribution. This species is found in evergreen forest vegetation in the Cordillera de la Costa in northern Venezuela (Aragua, Distrito Federal, Miranda).

40. Anemopaegma salicifolium (Kunth) Sandwith, Lilloa 3: 459. 1938. *Bignonia salicifolia* Kunth, Nov. Gen. Sp. 3: 133. 1818 [1819]. TYPE: Venezuela. River Orinoco, Apr., *F. W. H. A. von Humboldt & A. J. A. Bonpland 5027* (holotype, P-Bonpl. [barcode] P00468586!, P-Bonpl. as photo F neg. 39414 at MO-1692915!).

Habitat and distribution. This species is found in seasonally flooded forest vegetation in the Orinoco River basin of Venezuela (Amazonas, Bolívar) and presumably eastern Colombia (Gentry, 1997), and perhaps is also found in Brazil (Amazonas).

41. Anemopaegma santaritense A. H. Gentry, Ann. Missouri Bot. Gard. 58(1): 93, fig. 2. 1971, as "santa-ritensis." TYPE: Panama. Colón: SE of Santa Rita Ridge, 14 Feb. 1969, *A. H. Gentry 454* (holotype, MO-2018469!; isotypes, MO-2017611!, MO-2018468!, WIS not seen).

Habitat and distribution. This species is found in premontane forest vegetation in Costa Rica, Panama, and Colombia (Chocó, Cundinamarca, Santander).

42. Anemopaegma scabriusculum Mart. ex DC., in A. DC., Prodr. 9: 188. 1845. TYPE: Brazil. Minas Gerais: close to Serra de Santo Antônio & Contendas, July, *C. F. P. von Martius 501* (holotype, G-DC!; isotypes, M-86317!, M as photo F neg. 20456 at MO-1692749!, P [barcode] P00468587!).

Habitat and distribution. This species is found in cerrado and dry campo rupestre vegetation in central to eastern Brazil (Bahia, Goiás, Maranhão, Minas Gerais, Pará, Piauí, Tocantins).

43. Anemopaegma setilobum A. H. Gentry, Phytologia 46(4): 203. 1980. TYPE: Brazil. Espírito Santo: betw. Linhares & São Mateus, 22 Feb. 1965, *A. P. Duarte 8861* (holotype, RB-126214!; isotypes, HB not seen, MO-2193067!, MO-2698298!).

Habitat and distribution. This species is found in wet forest vegetation in central and eastern Brazil (Bahia, Espírito Santo, Maranhão, Minas Gerais, Pará, Piauí).

44. Anemopaegma velutinum Mart. ex DC., in A. DC., Prodr. 9: 189. 1845. TYPE: Brazil. Minas Gerais: Serro Frio, Aug. 1818, *C. F. P. von Martius s.n.* (lectotype, designated here, M-86319!; isolectotypes, BR-839801!, M-86320!).

Nomenclatural note. De Candolle did not cite a collection number in the protologue for this species, but reported that a specimen was seen in Martius's herbarium and that the species was known from Espírito Santo, Bahia, and Minas Gerais. Hence, a Martius collection of this species from Minas Gerais with duplicates in both M and BR is here selected as the type; there are two specimens at M, one with flowers and one with fruits, and the M specimen with flowers is here selected as the lectotype. A composite photo (F neg. 20457 at MO-1692754!) shows parts of both of the M sheets.

Habitat and distribution. This species is found in scrub vegetation on rocky outcrops in eastern Brazil (Bahia, Minas Gerais, Piauí).

45. Anemopaegma villosum A. H. Gentry, Ann. Missouri Bot. Gard. 63(1): 70. 1976. TYPE: Venezuela. Portuguesa: 5 km NE of Agua Blanca, 22 km NE of Acarigua, 190 m, 24 Aug. 1966, *J. A. Steyermark 96455* (holotype, VEN not seen, VEN as photocopy at MO-2300555!; isotypes, NY-313077!, US-2481599 image!).

Habitat and distribution. This species is found in forest vegetation, generally on calcareous soils, in northern Venezuela (Distrito Federal, Portuguesa).

IV. Bignonia L., Sp. Pl. 622. 1753. TYPE: *Bignonia capreolata* L., typ. cons.

Cydista Miers, Proc. Roy. Hort. Soc. London. 3: 191. 1863, syn. nov. TYPE: *Cydista aequinoctialis* (L.) Miers [≡ *Bignonia aequinoctialis* L.].

Anisostichus Bureau, Monogr. Bignon. 43. 1863. nom. superfl. illeg. TYPE: *Anisostichus capreolata* (L.) Bureau [≡ *Bignonia capreolata* L.].

Clytostoma Miers ex Bureau, Adansonia 8: 353. 1868, syn. nov. TYPE: *Clytostoma callistegioides* (Cham.) Bureau ex Griseb. [≡ *Bignonia callistegioides* Cham.].

Phryganocydia Mart. ex Bureau, Bull. Soc. Bot. France 19: 18. 1872, syn. nov. *Phrygiobureaua* Kuntze, in Post. & Kuntze, Lex. Gen. Phan. 433. 1903 [1904], nom. superfl. illeg. TYPE: *Phryganocydia corymbosa* (Vent.) Bureau ex K. Schum. [≡ *Bignonia corymbosa* (Vent.) L. G. Lohmann.].

Levya Bureau ex Baill., Hist. Pl. 10: 28. 1888. TYPE: *Levya nicaraguensis* Bureau ex Baill. [= *Bignonia aequinoctialis* L.].

Mussatia Bureau ex Baill., Hist. Pl. 10: 32. 1888, syn. nov. TYPE: *Mussatia prieurii* (DC.) Bureau ex K. Schum. [≡ *Bignonia prieurii* DC.].

Osmhydrophora Barb. Rodr., Vellosia, ed. 2, 1: 49. 1891, *Osmohydrophora*, orth. var. TYPE: *Osmhydrophora nocturna* Barb. Rodr. [≡ *Bignonia nocturna* (Barb. Rodr.) L. G. Lohmann.].

Macranthisiphon Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 219. 1894, syn. nov. TYPE: *Macranthisiphon longiflorus* (Cav.) K. Schum. [≡ *Bignonia longiflora* Cav.].

Roentgenia Urb., Ber. Deutsch. Bot. Ges. 34: 747. 1916, syn. nov. TYPE: *Roentgenia bracteomana* (K. Schum.) Urb. [≡ *Bignonia bracteomana* (K. Schum.) L. G. Lohmann].

Potamoganos Sandwith, Receuil Trav. Bot. Néerl. 34: 220. 1937, syn. nov. TYPE: *Potamoganos microcalyx* (G. Mey.) Sandwith [≡ *Bignonia microcalyx* G. Mey.].

Saritaea Dugand, Caldasia 3: 262. 1945, syn. nov. TYPE: *Saritaea magnifica* (W. Bull) Dugand (≡ *Bignonia magnifica* W. Bull).

Clytostomanthus Pichon, Bull. Soc. Bot. France 92: 224. 1946. TYPE: *Clytostomanthus decorus* (S. Moore) Pichon [≡ *Bignonia decora* (S. Moore) L. G. Lohmann].

Micropaegma Pichon, Bull. Soc. Bot. France 92: 225. 1946. TYPE: *Micropaegma brachycalyx* (Bureau & K. Schum) Pichon [= *Bignonia prieurii* DC.].

Lianas or shrubs, without dimorphic juvenile growth, without strong odor; stems with phloem wedges in multiples of 4 in cross-section, pith solid; branchlets cylindrical, irregularly angled, or tetragonal, glabrous (puberulous), without lenticels or with sparsely distributed lenticels, without interpetiolar glands, with discontinuous interpetiolar ridge, with epidermis not peeling; prophylls of axillary buds foliaceous and bromeliad-like (minute and triangular), with or without glands. Leaves 2-foliolate, terminal leaflet often replaced by a simple (minutely trifid or multifid) tendril, tendrils without adhesive disks, without uncinate apices; leaflets chartaceous to coriaceous, with glands grouped in axils of veins or sparsely distributed on lamina, without pellucid punctations, without domatia, petiolules not articulated; petiole cylindrical, never modified into a tendril, not articulated. Inflorescence terminal and/or axillary, a cyme, thyrse, fascicle, or raceme. Flowers zygomorphic, pentamerous; calyx cupular or tubular, shortly 5-lobed, 5-apiculate, or bilabiate, coriaceous, glabrous, puberulous, or villose externally, with or without glands near margins; corolla magenta (yellow, white, red), with or without nectar guides, tubular or infundibuliform and frequently dorso-ventrally flattened, straight in tube, membranaceous, glabrous to villose externally, without (with) glands, lobes 5, imbricate; stamens 4, with well-developed filaments, included (exserted), anthers glabrous, thecae straight, pollen in monads, inaperturate, colpate or porate, with exine reticulate or complex; ovary sessile, smooth or papillate and glabrous or lepidote externally, ovules in 1 series on each placenta, stigma rhombic, glabrous; disk annular or absent. Capsules linear (elliptic), flattened or inflated, straight, woody or coriaceous, with valves 2, glabrous, without lenticels, without glands, without wings, smooth, echinate, or tuberculate, with calyx caducous; seeds winged, with body smooth and glabrous, wings opaque, linear or rounded. Figures 10 and 11.

Number of species, distribution, and habitat. *Bignonia* includes 28 species found in wet to dry tropical forest and warm temperate forest vegetation from the southern U.S.A. to Argentina.

Bignonia is circumscribed much more broadly here than by recent authors, based on both morphological and molecular characters. It here includes *Cydista*, *Clytostoma*, *Macranthisiphon*, *Mussatia*, *Phryganocydia*, *Potamoganos*, *Roentgenia*, and *Saritaea*. In this wider circumscription *Bignonia* is characterized by stems in cross-section with eight phloem wedges that are often cylindrical and tetragonal within the same individual, consistently 2-foliolate leaves (e.g., Fig. 10A) with dense gland fields in the vein axils of the leaflets, simple or lepidote trichomes, simple or sometimes very shortly 3-parted tendrils, prophylls of the axillary buds that are foliaceous (Fig. 11O, S), bromeliad-like, or both (Fig. 11A, F, J), a single series of ovules on each placenta, reticulate pollen exine, and opaque seed wings.

The affinities among *Cydista*, *Clytostoma*, *Mussatia*, *Phryganocydia*, *Potamoganos*, and *Roentgoenia* have been hypothesized before (Gentry, 1973a; Hauk, 1997, 2002), based on a suite of shared morphological characters and especially the unusual mimetic pollination strategy, with the corollas dorso-ventrally flattened and displaying prominent nectar guides, although no nectar disk is present (Fig. 12) so the pollinators are deceived. *Mussatia* and *Clytostoma* in particular are similar (see Fig. 10B, D), and were separated based mainly on their fruits, elliptic and echinate in *Clytostoma* versus linear and smooth to tuberculate in *Mussatia* (Figs. 11C, H, 12). These were separated, even though Gentry himself noted (1973a: 241) that "[t]he fact that some species with

very different fruit morphologies are very closely related shows the inadvisability of arbitrarily segregating genera entirely on the basis of such characters." On the other hand, the relationship among these genera and *Bignonia*, *Saritaea*, *Macranthisiphon*, and *Tanaecium nocturnum* (Fig. 10C) has not been noted before. *Bignonia* in recent decades has been separated as a monotypic genus based on its combination of multifid tendrils, fasciculate inflorescences, and North American distribution (Fig. 12). *Saritaea* and *Macranthisiphon* were separated based on combinations of characters but considered related to each other based on their shared porate pollen with a complex exine ornamentation pattern, a form unique in the tribe Bignonieae. The hawkmoth-pollinated species *T. nocturnum* (Fig. 11C), on the other hand, was thought to be related to other hawkmoth-pollinated species of *Tanaecium*, even though *T. nocturnum* differs completely from the other species classified in *Tanaecium* in its eight phloem wedges and uniseriate ovules. The phylogenetic hypothesis of Bignonieae (Lohmann, 2006) indicates that, once again in this tribe, many flower and fruit characters are variable, while other features such as stem anatomy and ovule arrangement are good indicators of systematic relationships.

Within this *Bignonia* clade (Fig. 12) there are no clear patterns of characters nor well-supported subgroups, so systematically meaningful units cannot be separated. This clade as a whole is well characterized and therefore here circumscribed as a single genus, which takes the name *Bignonia*. *Macranthisiphon* was originally included here solely based on morphological affinities, but recent molecular phylogenetic studies corroborate its placement in the genus (Zuntini & Lohmann, in prep.).

1. Bignonia aequinoctialis L., Sp. Pl. 623. 1753. *Cydista aequinoctialis* (L.) Miers, Proc. Roy. Hort. Soc. London 3: 191. 1863. TYPE: tab. 58, Burman, Pl. Amer., 1756 (lectotype, designated by Gentry [1977: 57]).

Habitat and distribution. This species is commonly found in evergreen lowland to montane forest and disturbed vegetation (Gentry, 1997) in Mexico (Chiapas, Colima, Guerrero, Jalisco, Nayarit, Oaxaca, Sinaloa, Tabasco, Veracruz, Yucatán), the Antilles (Antigua, Barbados, Cuba, Dominica, Dominican Republic, Grenada, the Grenadines, Guadeloupe, Haiti, Martinique, Puerto Rico, St. Lucia, St. Vincent, Virgin Islands), Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Amazonas, Antioquia, Atlántico, Bolívar, Boyacá, Caquetá, César, Chocó, Córdoba, Cundinamarca, Guaviare, Magdalena, Meta, Nariño, Norte de Santander, Santander, Sucre, Tolima, Valle del Cauca, Vaupés, Vichada), Venezuela (Amazonas, Anzoátegui, Apure, Aragua, Barinas, Bolívar, Carabobo, Delta Amacuro, Distrito Federal, Falcón, Lara, Mérida, Miranda, Monagas, Sucre, Táchira, Trujillo, Zulia), Trinidad and Tobago, Guyana, Suriname, French Guiana, Ecuador, Peru (Amazonas, Junín, Loreto, Madre de Dios, Ucayali), Bolivia, and Brazil (Acre, Amapá, Amazonas, Goiás, Maranhão, Mato Grosso, Pará, Rondônia, Roraima).

2. Bignonia binata Thunb., Pl. Bras. 3: 35. 1821. *Clytostoma binatum* (Thunb.) Sandwith, Receuil Trav. Bot. Néerl. 34: 231. 1937. TYPE: Brazil. s. loc., s.d., *G. W. Freyreis s.n.* (holotype, UPS-14225!).

Habitat and distribution. This species is found in swampy, usually riverside lowland forest vegetation (Gentry, 1997) in Mexico (Campeche, Chiapas, Jalisco, Oaxaca, Quintana Roo, Tabasco, Veracruz), Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Amazonas, Antioquia, Caquetá, Chocó, Meta, Nariño, Putumayo, Santander, Sucre, Valle del Cauca, Vaupés, Vichada), Venezuela (Amazonas, Anzoátegui, Apure, Bolívar, Delta Amacuro, Guárico, Sucre, Táchira, Zulia), Guyana, Suriname, French Guiana, Ecuador, Peru (Huánuco, Loreto, Madre de Dios, Puno, San Martín, Tumbes, Ucayali), Bolivia, Paraguay, Brazil (Amapá, Amazonas, Bahia, Ceará, Espírito Santo, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraiba, Paraná, Pernambuco, Rio de Janeiro, Rio Grande do Sul, Rondônia, Roraima, Santa Catarina, São Paulo), and Argentina (Chaco, Corrientes, Misiones, Salta).

3. Bignonia bracteomana (K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Cydista bracteomana* K. Schum., in Sprague, Verh. Bot. Vereins Prov. Brandenburg 50: 121. 1908 [1909]. *Roentgenia bracteomana* (K. Schum.) Urb., Ber. Deutsch. Bot. Ges. 34: 748. 1916. *Bignonia bracteomana* (K. Schum.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 763. 2010, nom. nud. invalid. TYPE: Brazil. Amazonas: Victoria, Rio Juruá, May 1901, *E. Ule 5497* (holotype, B†; isotypes, HBG not seen, L not seen, MG not seen).

Nomenclatural note. The holotype specimen has been destroyed, and several duplicates have been cited in the literature but not seen in this study. Additional material may also exist, therefore more work is necessary before the typification of this

species can be clarified. Ongoing monographic studies of *Bignonia* are addressing this problem (Zuntini, Taylor & Lohmann, in prep.).

Habitat and distribution. This species is found in lowland wet forest vegetation in Colombia (Caquetá, Putumayo), Ecuador, Peru (Amazonas, Loreto, Madre de Dios, Puno, San Martín, Ucayali), Bolivia, and Brazil (Amazonas, Maranhão).

4. **Bignonia callistegioides** Cham., Linnaea 7: 712. 1832 [1833]. *Cuspidaria callistegioides* (Cham.) DC., in A. DC., Prodr. 9: 178. 1845. *Clytostoma callistegioides* (Cham.) Bureau ex Griseb., Symb. Fl. Argent. 257. 1879, as "*calystegioides*." *Pithecoctenium callistegioides* (Cham.) Niederl., Bol. Mens. Mus. Prod. Argent. 3(31): 320. 1890, as "*calystegioides*." TYPE: Brazil. s. loc., s.d., *F. Sellow s.n.* (holotype, LE not seen; isotypes, B†, G-DC!, NY-313137!).

Habitat and distribution. This species is found in dry forest vegetation in Bolivia, Paraguay, Brazil (Rio Grande do Sul), Uruguay, and Argentina (Buenos Aires, Corrientes, Entre Ríos, Jujuy, Misiones, Salta), and also is widely cultivated.

5. **Bignonia campanulata** Cham., Linnaea 7: 711. 1832 [1833]. *Cuspidaria campanulata* (Cham.) DC., Prodr. 9: 179. 1845. *Clytostoma campanulatum* (Cham.) Bureau & K. Schum., Fl. Bras. 8(2): 148. 1896. TYPE: Brazil. s. loc., s.d., *F. Sellow 182* (holotype, LE not seen; isotypes, B†, B as photo F neg. 18434 at MO-1185443!, BR-880329!, NY-313138!).

Habitat and distribution. This species is found in humid and Atlantic forest vegetation in Peru (Madre de Dios), northern Bolivia, and Brazil (Bahia, Minas Gerais, Paraíba, Rio de Janeiro, São Paulo).

6. **Bignonia capreolata** L., Sp. Pl. 2: 624. 1753. *Doxantha capreolata* (L.) Miers, Proc. Roy. Hort. Soc. London 3: 190. 1863. *Anisostichus capreolata* (L.) Bureau, Monogr. Bignon. 43. 1864. TYPE: Herb. Clifford: 317, Bignonia no. 2 excluding open flower (lectotype, designated by Reveal [1993: 24]).

Habitat and distribution. This species is found in warm temperate forest and disturbed vegetation in the southeastern United States (Alabama, Arkansas, Florida, Georgia, Illinois, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, South Carolina, Tennessee, Texas, Virginia, West Virginia).

7. **Bignonia convolvuloides** (Bureau & K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Clytostoma convolvuloides* Bureau & K. Schum., Fl. Bras. 8(2): 154. 1896. *Bignonia convolvuloides* (Bureau & K. Schum.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 763. 2010, nom. nud. invalid. TYPE: Brazil. Bahia: Jacobina, June 1844, *J. S. Blanchet 3849* (lectotype, designated here, P [barcode] P00481528!; isolectotypes, BR-880355!. G-9449!, G-9450!).

Nomenclatural note. Two syntypes were cited in the protologue of this name, *Sellow 734* and *Blanchet 3849*. The *Sellow 734* material presumably deposited at B has been destroyed and duplicate material has not been located, hence the collection *Blanchet 3849* is here designated as the type with the sheet at P chosen as the lectotype because it is in good condition and could have been studied by Bureau.

Habitat and distribution. This species is found in dry forest vegetation in Bolivia, Paraguay, and Brazil (Bahia, Mato Grosso, Minas Gerais, Pernambuco).

8. **Bignonia corymbosa** (Vent.) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 272. 2008. *Spathodea corymbosa* Vent., Mem. Cl. Sci. Math. Inst. Natl. France 8: 19. 1807. *Macfadyena corymbosa* (Vent.) Griseb., Bonplandia (Hannover) 6: 10. 1858. *Phryganocydia corymbosa* (Vent.) Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 224. 1894. *Phrygiobureaua corymbosa* (Vent.) Kuntze, Lex. Gen. Phan. 433. 1903 [1904]. TYPE: Trinidad. s. loc., s.d., *A. Riedlé s.n.* (holotype, P [barcode] P00481551!).

Habitat and distribution. This species is found frequently in semideciduous to evergreen forest and disturbed vegetation (Gentry, 1997) in the Lesser Antilles (Grenada, Martinique, St. Vincent, Virgin Islands), Costa Rica, Panama, Colombia (Antioquia, Atlántico, Bolívar, Boyacá, Caldas, Caquetá, César, Chocó, Córdoba, La Guajira, Magdalena, Meta, Nariño, Norte de Santander, Santander, Sucre, Vaupés, Vichada), Venezuela (Amazonas, Anzoátegui, Apure, Aragua, Barinas, Bolívar, Carabobo, Cojedes, Delta Amacuro, Distrito Federal, Falcón, Guárico, Lara, Miranda, Monagas, Portuguesa, Sucre, Táchira, Trujillo, Yaracuy, Zulia), Trinidad and Tobago, Guyana, French Guiana, Ecuador, Peru (Loreto), Bolivia, and Brazil (Acre, Alagoas, Amazonas, Bahia, Ceará, Distrito Federal, Espírito Santo, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Pernambuco, Rio de Janeiro, Rondônia).

9. Bignonia costata (Bureau & K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Clytostoma costatum* Bureau & K. Schum., Fl. Bras. 8(2): 150. 1896. TYPE: Brazil. Rio de Janeiro: Rio Jaú, close to Maxambamba, 19 Oct. 1876, *A. Glaziou 8813* (lectotype, designated here, P [barcode] P00481532!; isolectotypes, BR-880497!, BR-880530!, C not seen, C as photo F neg. 322131 at MO-1692953!, G-9448!, K [barcode] K000449464!, K [barcode] K000449465!, NY-328759!, NY as photocopy at MO-2927253!, P [barcode] P00481531!, P [barcode] P00481533!).

Nomenclatural note. Four syntypes were cited in the original description of *Clytostoma costata*, *Glaziou 849*, *Glaziou 2108*, *Glaziou 6815*, and *Glaziou 8813*. The collection *Glaziou 8813* has the best material, the highest number of duplicates, and the widest distribution and is chosen here as the type. The sheet P [barcode] P00481532 is designated as the lectotype because it has ample material with the most typical leaf form.

Habitat and distribution. This species is found in wet forest vegetation in southeastern Brazil (Rio de Janeiro).

10. Bignonia cuneata (Dugand) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 272. 2008. *Clytostoma cuneatum* Dugand, Caldasia 3(13): 259. 1945. TYPE: Colombia. Atlántico: betw. Palmar de Varela & Ponedora, finca El Paraiso, 2–4 Aug. 1943, *A. Dugand & R. Jaramillo 3457* (lectotype, designated here, COL-14544 image!; isolectotype, COL-14545 image!).

Nomenclatural note. Four different collections were cited in the protologue of *Clytostoma cuneatum*, with only one explicitly designated as the type and the other three called co-types. The term co-type was often used contemporaneously to designate isotypes and these other collections have been interpreted as such in sched. However, in this case Dugand stated that the co-types were used in the preparation of the description in addition to the type, and thus these are clearly paratypes in today's terminology. Dugand did not list or distinguish duplicates of the type collection in this protologue, but two specimens of this are deposited at COL; the specimen with more, better material is here designated as the lectotype.

Habitat and distribution. This species is found in seasonal forest vegetation in northern Colombia (Atlántico, Bolívar) and northwestern Venezuela (Falcón, Miranda).

11. Bignonia decora (S. Moore) L. G. Lohmann, comb. nov. Basionym: *Anemopaegma decorum* S. Moore, Trans. Linn. Soc. London, ser. 2, 4: 421. 1895. *Clytostoma decorum* (S. Moore) Bureau & K. Schum., Fl. Bras. 8(2): 151. 1896. *Arrabidaea decora* (S. Moore) Hassl., Repert. Spec. Nov. Regni Veg. 9: 49. 1910. *Clytostomanthus decorus* (S. Moore) Pichon, Bull. Soc. Bot. France 92: 224. 1945. *Cydista decora* (S. Moore) A. H. Gentry, Selbyana 2: 42. 1977. *Bignonia decora* (S. Moore) L. G. Lohmann, Cat. Pl. Vasc. Cono Sur 2: 1595. 2008, nom. nud. invalid. *Bignonia decora* (S. Moore) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 763, nom. nud. invalid. TYPE: Brazil. Mato Grosso: Corumbá, Jan. 1891–1892, *S. Moore "980" [950]* (holotype, BM!; isotype, NY-313062!).

Nomenclatural note. Moore (1895) cited the same type specimen number, 980, for *Adenocalymma croceum* S. Moore and *Anemopaegma decorum*, but these are distinct species and their respective type specimens represent the corresponding species. The holotype specimen of *Adenocalymma croceum* at BM does have two labels with two different collection numbers, 950 and 980, but this specimen is currently databased at BM under the number 950 and that is here assumed to be the correct number.

Habitat and distribution. This species is found in dry forest vegetation in western Ecuador, Bolivia, Paraguay, and Brazil (Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraná).

12. Bignonia diversifolia Kunth, Nov. Gen Sp. Pl. 3: 133. 1818 [1819]. *Cydista diversifolia* (Kunth) Miers, Proc. Roy. Hort. Soc. London 3: 192. 1863. *Pleonotoma diversifolia* (Kunth) Bureau & K. Schum., Fl. Bras 8(2): 274. 1897. TYPE: Mexico. Campeche: s. loc., s.d., *A. J. A. Bonpland s.n.* (holotype, P-Bonpl.!, P-Bonpl. as photo F neg. 39412 at MO-1692918!).

Habitat and distribution. This species is found frequently in wet to dry vegetation in Mexico (Campeche, Chiapas, Guerrero, Jalisco, Michoacán, Oaxaca, Quintana Roo, Tabasco, Yucatán), the Greater Antilles (Cuba), Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Antioquia, Atlántico, Bolívar, Boyacá, César, Cundinamarca, Huila, La Guajira, Magdalena, Norte de Santander, Santander, Sucre, Tolima, Valle del Cauca), Venezuela (Anzoátegui, Aragua, Carabobo, Coejedes, Distrito Federal, Falcón, Guárico, Lara, Miranda, Portuguesa, Táchira, Trujillo, Yaracuy,

Zulia), and Brazil (Goiás, Maranhão, Mato Grosso, Tocantins).

13. Bignonia hyacinthina (Standl.) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 272. 2008. *Tynanthus hyacinthinus* Standl., Publ. Carnegie Inst. Wash. 461(4): 87. 1935. *Mussatia hyacinthina* (Standl.) Sandwith, Recueil Trav. Bot. Néerl 34: 218. 1937. TYPE: British Honduras [Belize]. Jacinto Creek, 60 ft., 28 Apr. 1934, *W. A. Schipp S-661* (holotype, F-733483 image!, F-733483 as unnumbered photo at MO-1183674!; isotypes, G!, K!, NY-328980!).

Habitat and distribution. This species is found in semideciduous to evergreen lowland forest vegetation (Gentry, 1997) in Mexico (Campeche, Chiapas, Guerrero, Oaxaca, Puebla, Veracruz), Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Chocó, La Guajira, Meta, Valle del Cauca), Venezuela (Amazonas, Anzoátegui, Aragua, Barinas, Bolívar, Carabobo, Cojedes, Delta Amacuro, Distrito Federal, Mérida, Miranda, Monagas, Táchira, Yaracuy, Zulia), Guyana, Ecuador, Peru (Loreto, Madre de Dios, Pasco, Puno, San Martín), Bolivia, and Brazil (Acre, Pará, Roraima).

14. Bignonia lilacina (A. H. Gentry) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 272. 2008. *Cydista lilacina* A. H. Gentry, Mem. New York Bot. Gard. 29: 277, figs. 124B, 125. 1978. TYPE: Venezuela. Bolívar: Tumeremo to Anacoco (N side of Cuyuni River), 56–57 km from Guyana frontier at Anacoco, 140–200 m alt., 18 Mar. 1974, *A. H. Gentry, G. Morillo & B. de Morillo 10673* (holotype, MO-2198604!; isotypes, MO-2198605!, VEN not seen).

Habitat and distribution. This species is found in evergreen lowland forest vegetation (Gentry, 1997) in Colombia (Amazonas, Bolívar), Venezuela (Amazonas, Barinas, Bolívar, Delta Amacuro, Sucre), Suriname, French Guiana, Ecuador, Peru (Cusco, Huánuco, Junín, Loreto, Madre de Dios, San Martín, Ucayali), Bolivia, and Brazil (Acre, Amazonas, Maranhão, Mato Grosso, Minas Gerais, Pará, Rondônia, Roraima).

15. Bignonia longiflora Cav., Icon. 6: 58, tab. 581. 1801. *Pyrostegia longiflora* (Cav.) Miers, Proc. Roy. Hort. Soc. London 3: 188. 1863. *Macranthisiphon longiflorus* (Cav.) K. Schum., Nat. Pflanzenfam. 4(3b): 219. 1894. TYPE: Ecuador. Guayaquil, s.d., *L. Nee s.n.* (lectotype, designated here, MA-652465!, MA-652465 as photo F neg. 29231 at MO-1692897!; isolectotype, MA-475442!).

Nomenclatural note. Cavanilles's material is deposited in Madrid (Stafleu & Cowan, 1976), and the specimen found there with the best material is here selected as the lectotype.

Habitat and distribution. This species is found in seasonal vegetation in western Ecuador (El Oro, Guayas, Loja, Manabí) and northwestern Peru (Piura, Tumbes).

16. Bignonia magnifica W. Bull, Gard. Chron., n. s. 12: 72, fig. 9. 1879. *Arrabidaea magnifica* (W. Bull) Sprague ex Steenis, Receuil Trav. Bot. Néerl. 24: 830. 1927. *Saritaea magnifica* (W. Bull) Dugand, Caldasia 3: 263. 1945. TYPE: Colombia. Magdalena: Santa Marta, 1500 ft., Sep. 1898–1901, *H. H. Smith 741* (neotype, designated by Steenis [1927: 830], U not seen; isoneotypes, BM!, BR!, K [barcode] K000404058!, K [barcode] K000404059!, MO-2005575!, NY [barcode] NY00313101!, NY [barcode] NY00313102!, US-600311 image!).

Habitat and distribution. This species is found in wet forest vegetation in the Greater Antilles (Cuba, Dominican Republic, Jamaica), Panama, Colombia (Atlántico, César, Magdalena, Norte de Santander, Risaralda, Santander, Valle del Cauca), Venezuela (Distrito Federal, Guárico, Miranda), and Ecuador, and is cultivated in tropical regions worldwide.

17. Bignonia microcalyx G. Mey., Prim. Fl. Esseq. 211. 1818. *Anemopaegma microcalyx* (G. Mey.) Bureau & K. Schum., Fl. Bras. 8(2): 134. 1896. *Potamoganos microcalyx* (G. Mey.) Sandwith, Receuil Trav. Bot. Néerl. 34: 220. 1937. TYPE: British Guiana [Guyana]. s. loc., s.d., *G. Meyer s.n.* (holotype, GOET not seen).

Habitat and distribution. This species is found in evergreen lowland forest vegetation (Gentry, 1997) in Colombia (Amazonas), Venezuela (Amazonas), Guyana, Suriname, and Brazil (Amapá, Amazonas, Pará).

18. Bignonia neoheterophylla L. G. Lohmann, nom. nov. Replaced name: *Cydista heterophylla* Seibert, Publ. Carnegie Inst. Wash. 522: 417. 1940, non *Bignonia heterophylla* Willd., 1800 [1801]. TYPE: Mexico. Yucatán: near Xocenpich, May–Aug 1938, *C. L. Lundell & A. A. Lundell 7350* (holotype, MICH not seen, MICH as unnumbered photo at MO-1244826!; isotypes, A not seen, F-1309020 image!, LL

[unnumbered, 2] not seen, LL as photocopies at MO-3571763! and MO-3571764!, S not seen, US-1840031 image!).

Nomenclatural note. The name *Bignonia heterophylla* has already been published for another species, and although this name is now considered a synonym of *Pachyptera kerere* (Aubl.) Sandwith, it still exists. Therefore when the name *Cydista heterophylla* is transferred to *Bignonia* it needs a new name in the latter genus, which is provided here.

Habitat and distribution. This species is found frequently in humid to usually dry vegetation in Mexico (Campeche, Chiapas, Guerrero, Jalisco, Nayarit, Oaxaca, Quintana Roo, Tabasco, Veracruz, Yucatán), the Greater Antilles (Cuba), Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, and Colombia (Bolívar, Sucre).

19. Bignonia neouliginosa L. G. Lohmann, nom. nov. Replaced name: *Phryganocydia uliginosa* Dugand, Caldasia 4(16): 59. 1946, non *Bignonia uliginosa* Gomes, 1803. TYPE: Colombia. Atlántico: betw. Palmar de Varela & Ponedera, swamps of Río Magdalena, farm El Paraíso, 2–4 Aug. 1943, *A. Dugand & R. Jaramillo 3491* (holotype, COL-14564 image!; isotype, US-1852300 image!).

Nomenclatural note. The name *Bignonia uliginosa* has already been published for another species, and although this name is now considered a synonym of *Tabebuia cassinoides* (Lam.) DC., it still exists. Therefore when the name *Phryganocydia uliginosa* is transferred to *Bignonia* it needs a new name, which is provided here.

Habitat and distribution. This species is found in swampy forest vegetation in the Magdalena River valley of Colombia (Atlántico, Bolívar, César, Santander).

20. Bignonia nocturna (Barb. Rodr.) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 272. 2008. *Osmhydrophora nocturna* Barb. Rodr., Vellosia, ed. 2, 1: 49, 3: tab. 8, 9. 1885–1888 [1891]. *Tanaecium nocturnum* (Barb. Rodr.) Bureau & K. Schum., Fl. Bras. 8(2): 185. 1896. TYPE: Brazil. Amazonas: forests of Rio Purus & secondary vegetation near Manaus, Feb., *J. Barbosa Rodrigues s.n.* (holotype, not located).

Nomenclatural note. The type of *Osmhydrophora nocturna* has not been located at RB, where the surviving material of Barbosa Rodrigues is deposited. Many of his types were at INPA, and most of those have been lost (Mori & Ferreira, 1987). Further study is needed for the typification of this species (Zuntini, Taylor & Lohmann, in prep.).

Habitat and distribution. This species is found widely in wet forest vegetation in eastern Panama, Colombia (Amazonas, Antioquia, Bolívar, Chocó, Santander), Suriname, French Guiana, Ecuador, Peru (Amazonas, Cusco, Huánuco, Loreto, Madre de Dios, Pasco, San Martín, Ucayali), Bolivia, and Brazil (Acre, Amazonas, Goiás, Mato Grosso, Pará, Rondônia).

21. Bignonia phellosperma (Hemsl.) L. G. Lohmann, comb. nov. Basionym: *Macfadyena phellosperma* Hemsl., Biol. Cent.-Amer., Bot. 2(12): 492. 1882. *Phryganocydia phellosperma* (Hemsl.) Sandwith, Bull. Misc. Inform. Kew 1940(7): 302. 1940 [1941]. TYPE: Panama. Canal Zone [Coclé]: swamps of Río Grande, June 1861, *S. Hayes 81* (holotype, K!; isotype, BM-630059!).

Habitat and distribution. This species is found in mangrove vegetation along the Pacific coast of Costa Rica, Panama, and Colombia (Chocó, Nariño).

22. Bignonia potosina (K. Schum. & Loes.) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea potosina* K. Schum. & Loes., Bull. Herb. Boissier 3(12): 618. 1895. *Cydista potosina* (K. Schum. & Loes.) Loes., Repert. Spec. Nov. Regni Veg. 16: 209. 1919. TYPE: Mexico. San Luis Potosí, s.d., *G. E. Seler & C. Seler 616* (holotype, B†).

Nomenclatural note. Ongoing work will clarify the typification of this species (Zuntini, Taylor & Lohmann, in prep.).

Habitat and distribution. This species is found in wet and seasonal forest vegetation in Mexico (Campeche, Chiapas, Oaxaca, Puebla, Quintana Roo, San Luis Potosí, Tabasco, Tamaulipas, Veracruz, Yucatán), Belize, Guatemala, El Salvador, Honduras, Nicaragua, and northern Costa Rica.

23. Bignonia prieurii DC., in A. DC., Prodr. 9: 154. 1845, as "*prieurei.*" *Panterpa prieurii* (DC.) Miers, Proc. Roy. Hort. Soc. London 3: 196. 1863. *Mussatia prieurii* (DC.) Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 224. 1894. TYPE: French Guiana. s. loc., 1834, *F. R. Le Prieur 273* (holotype, G-DC!, G-DC as photo F neg. 26198 at MO-1692901!; isotypes, G-9262!, G [no #] as photo F neg. 7639 at MO-169202!, P [barcode] P00468591!, P [barcode] P00468592!).

Habitat and distribution. This species is found in evergreen lowland forest (Gentry, 1997) in Colombia (Amazonas, Caquetá, Vaupés), Venezuela (Amazonas, Bolívar), Guyana, French Guiana, Suriname, Ecuador, Peru (Loreto, Madre de Dios, Ucayali), Bolivia, and Brazil (Acre, Amapá, Amazonas, Bahia, Espírito Santo, Minas Gerais, Pará, Rondônia).

24. Bignonia pterocalyx (Sprague ex Urb.) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 272. 2008. *Clytostoma pterocalyx* Sprague ex Urb., Ber. Deutsch. Bot. Ges. 34: 741. 1916. TYPE: Colombia. Magdalena: Santa Marta, 150 ft., 1898, *H. H. Smith 2401* (holotype, B†; lectotype, designated here, NY-328761!; isolectotypes, BR!, F-139139 image!, G-9663!, MO-1998976!, NY [barcode] NY00328760!, NY [barcode] NY00579039!, P [barcode] P00481526!, P [barcode] P00481527!, US-600410 image!).

Nomenclatural note. The lectotype chosen here is the specimen with the best material, which is also part of Smith's main set at NY.

Habitat and distribution. This species is found in wet forest vegetation in northern Colombia (Antioquia, Atlántico, Bolívar, César, Madgalena, Sucre) and northwestern Venezuela (Lara, Trujillo, Zulia).

25. Bignonia ramentacea (Mart. ex DC.) L. G. Lohmann, comb. nov. Basionym: *Cuspidaria ramentacea* Mart. ex DC., in A. DC., Prodr. 9: 178. 1845. *Clytostoma ramentaceum* (Mart. ex DC.) Bureau & K. Schum., Fl. Bras. 8(2): 150. 1896. *Bignonia ramentacea* (Mart. ex DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 763. 2010, nom. nud. invalid., as "ramantacea." TYPE: Brazil. Minas Gerais: betw. Salgado & Contendas, Aug. 1818, *C. F. P. von Martius s.n.* (holotype, M-86401!, M as photo F neg. 20459 at MO-1692937!; isotype, G-DC!).

Habitat and distribution. This species is found in dry caatinga and cerrado vegetation in eastern Brazil (Bahia, Ceará, Mato Grosso, Minas Gerais, Pernambuco).

26. Bignonia sciuripabulum (K. Schum.) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 272. 2008, as "*sciuripabula*." *Arrabidaea sciuripabulum* K. Schum., Nat. Pflanzenfam. 4(3b): 224. 1894. *Clytostoma sciuripabulum* (K. Schum.) Bureau & K. Schum., Fl. Bras. 8(2): 149. 1896. *Pithecoctenium sciuripabulum* (K. Schum.) Corr. Méllo, Arq. Mus. Paranaense 9: 53. 1952. TYPE: Brazil. São Paulo: Campinas, 20 Sep. 1867, *J. Correia de Méllo 22* (holotype, B†; isotypes, C not seen, C as photo F neg. 22132 at MO-1692938!, K [2] not seen, K as photocopies at MO-2904347! and MO-2904348!).

Nomenclatural note. Ongoing monographic study of *Bignonia* will clarify the typification of this species (Zuntini, Taylor & Lohmann, in prep.).

Habitat and distribution. This species is commonly and widely collected in evergreen lowland forest vegetation (Gentry, 1997) in Colombia (Amazonas, Córdoba), Venezuela (Amazonas, Anzoátegui, Apure, Aragua, Bolívar, Carabobo, Distrito Federal, Lara, Miranda, Nueva Esparta), Guyana, Ecuador, Peru (Amazonas, Cusco, Junín, Loreto, Madre de Dios, Puno, Ucayali), Bolivia, Paraguay, Brazil (Acre, Alagoas, Amazonas, Bahia, Espírito Santo, Maranhão, Mato Grosso, Minas Gerais, Pará, Paraná, Pernambuco, Rio de Janeiro, Rio Grande do Sul, Santa Catarina, São Paulo), and Argentina (Misiones).

27. Bignonia sordida (Bureau & K. Schum.) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 272. 2008. *Arrabidaea sordida* Bureau & K. Schum., Fl. Bras. 8(2): 30. 1896. *Roentgenia sordida* (Bureau & K. Schum.) Sprague & Sandwith, Bull. Misc. Inform. Kew 1932: 91. 1932. TYPE: British Guiana [Guyana]. Upper Rupununi River, s.d., *Rich. H. Schomburgk 1296* (holotype, B†).

Nomenclatural note. Ongoing monographic study of *Bignonia* will clarify the typification of this species (Zuntini, Taylor & Lohmann, in prep.).

Habitat and distribution. This species is found in evergreen lowland forest vegetation (Gentry, 1997) in Venezuela (Bolívar, Delta Amacuro), Guyana, Suriname, French Guiana, and Brazil (Amapá, Amazonas, Goiás, Maranhão, Pará, Tocantins).

28. Bignonia uleana (Kraenzl.) L. G. Lohmann, comb. nov. Basionym: *Clytostoma uleanum* Kraenzl., Notizbl. Bot. Gart. Berlin-Dahlem 6: 374. 1915. TYPE: Brazil. Acre: Alto Acre, River São Francisco, s.d., *E. Ule 102b* (holotype, B†; isotype, HBG not seen).

Nomenclatural note. Ongoing monographic study of *Bignonia* will clarify the typification of this species (Zuntini, Taylor & Lohmann, in prep.).

Habitat and distribution. This species is found rather frequently in wet and seasonal forest vegetation in Peru (Cusco, Huánuco, Loreto, Madre de Dios, San

Martín, Ucayali), Bolivia, and Brazil (Acre, Minas Gerais, Rondônia).

V. Callichlamys Miq., Linnaea 18: 254. 1845. TYPE: *Callichlamys riparia* Miq., nom. illeg. superfl. [≡ *Callichlamys latifolia* (Rich.) K. Schum.].

Lianas, without dimorphic juvenile growth, without strong odor; stems with 4 phloem wedges in cross-section, pith solid; branchlets cylindrical, glabrous, covered with lenticels, without interpetiolar glands, with discontinuous interpetiolar ridge, with epidermis not peeling; prophylls of axillary buds triangular and minute, without glands. Leaves 2- or 3-foliolate, terminal leaflet often replaced by a simple tendril, tendrils without adhesive disks, without uncinate apices; leaflets coriaceous, with glands sparsely distributed over lamina, without pellucid punctations, without domatia, petiolules not articulated; petiole cylindrical, never modified into a tendril, not articulated. Inflorescence axillary, a raceme. Flowers zygomorphic, pentamerous; calyx spathaceous, thickly spongy, puberulous externally, with sparse glands; corolla bright yellow, without nectar guides, infundibuliform, straight in tube, coriaceous, puberulous externally, without glands, lobes 5, imbricate; stamens 4, with well-developed filaments, included, anthers glabrous, thecae straight, pollen in monads, colpate, with exine reticulate; ovary sessile, smooth and glabrous externally, ovules in multiple series on each placenta, stigma lanceolate, glabrous; disk annular. Capsules elliptic, flattened, straight, woody, with valves 2, glabrous, without lenticels, with scattered glands, without wings, smooth, with calyx caducous; seeds winged, with body smooth and glabrous, wings opaque, linear. Figure 13A, B.

Number of species, distribution, and habitat. *Callichlamys* includes one species found in wet to dry forest vegetation from Mexico to Brazil.

The circumscription of *Callichlamys* as a small genus has remained constant since its description, and as recently regarded taxonomically it is monotypic. The phylogeny hypothesis of Bignonieae (Lohmann, 2006) corroborates this characterization of *Callichlamys* as a lineage that has not diversified. *Callichlamys* can be recognized by its spathaceous, thickly spongy calyx (an apomorphy of the genus; Fig. 13A), ovules arranged in several series on each placenta (also an apomorphy), a relatively large (5–10 cm long) bright yellow corolla (Fig. 13A), and distinctive large (more than 20 cm long) woody, elliptic, smooth fruits.

1. Callichlamys latifolia (Rich.) K. Schum, Nat. Pflanzenfam. 4(3b): 223. 1894. *Bignonia latifolia* Rich., Actes Soc. Hist. Nat. Paris 1: 110. 1792. *Tabebuia latifolia* (Rich.) DC., Bibl. Univ. Genève sér. 2 17: 131. 1838. *Delostoma latifolium* (Rich.) Splitg., Tijdschr. Natuurl. Gesch. Physiol. 9: 11. 1842. *Callichlamys riparia* Miq., Linnaea 18: 254. 1845, nom. illeg. superfl. TYPE: French Guiana. Rio Kourou, s.d., *J. B. Le Blond s.n.* (lectotype, designated here, P [barcode] P00481534!; isolectotypes, P [barcode] P00481535!, P [barcode] P00481536!).

Nomenclatural note. Original material of the type collection is at P. Three duplicates are deposited there and the best material is here selected as the lectotype.

Habitat and distribution. This species is found frequently and widely in dry, seasonal, and wet lowland to premontane vegetation in Mexico (Chiapas, Oaxaca, Puebla, Veracruz), Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Amazonas, Antioquia, Bolívar, Boyacá, Caquetá, César, Chocó, Córdoba, Cundinamarca, La Guajira, Madgalena, Nariño, Risaralda, Santander, Sucre, Tolima, Valle del Cauca), Venezuela (Amazonas, Aragua, Barinas, Bolívar, Carabobo, Delta Amacuro, Distrito Federal, Lara, Miranda, Monagas, Táchira, Yaracuy, Zulia), Guyana, Suriname, French Guiana, Ecuador, Peru (Huánuco, Junín, Loreto, Madre de Dios, Pasco, San Martín, Ucayali), Bolivia, and Brazil (Acre, Amapá, Amazonas, Bahia, Espírito Santo, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Pernambuco, Rio de Janeiro, Rondônia, Roraima, São Paulo).

VI. Cuspidaria DC., Biblioth. Universelle Genève, sèr. 2, 17: 125. Oct. 1838, nom. cons., vs. *Cuspidaria* (DC.) Besser (Brassicaceae). TYPE: *Cuspidaria pterocarpa* (Cham.) DC. [= *Cuspidaria convoluta* (Vell.) A. H. Gentry].

Nouletia Endl., Gen. Pl. 1407. 1841. TYPE: *Nouletia pterocarpa* (Cham.) Pichon (lectotype, designated by Pichon [1946: 228]) [= *Cuspidaria convoluta* (Vell.) A. H. Gentry].

Cremastus Miers, Proc. Roy. Hort. Soc. London 3: 187. 1863. TYPE: *Cremastus glutinosus* (DC.) Miers (lectotype, designated by Baillon [1888: 28]) [= *Cuspidaria sceptrum* (Cham.) L. G. Lohmann].

Saldanhaea Bureau, Adansonia 8: 354. 1868, nom. illeg. hom., non *Saldanha* Vell., 1825. TYPE: *Saldanhaea lateriflora* (Mart.) Bureau [≡ *Cuspidaria lateriflora* (Mart.) DC.].

Setilobus Baill., Hist. Pl. 10: 29. 1888. TYPE: *Setilobus bracteatus* Baill. ex Bureau & K. Schum. [≡ *Cuspidaria bracteata* (Baill. ex Bureau & K. Schum.) L. G. Lohmann].

Blepharitheca Pichon, Bull. Soc. Bot. France 92: 224. 1946. TYPE: *Blepharitheca floribunda* (Mart. ex DC.) Pichon [≡ *Cuspidaria floribunda* (Mart. ex DC.) A. H. Gentry].

Tetrastichella Pichon, Bull. Soc. Bot. France 92: 223. 1946. TYPE: *Tetrastichella inaequalis* (DC. ex Splitg.) Pichon [≡ *Cuspidaria inaequalis* (DC. ex Splitg.) L. G. Lohmann].

Paracarpaea (K. Schum.) Pichon, Bull. Soc. Bot. France 92: 223. 1946. *Arrabidaea* sect. *Paracarpaea* K. Schum., Nat. Pflanzenfam. 4(3b): 214. 1894. TYPE: *Paracarpaea pulchella* (Cham.) Pichon (lectotype, designated by Pichon [1946: 223]) [≡ *Cuspidaria pulchella* (Cham.) K. Schum.].

Sideropogon Pichon, Bull. Soc. Bot. France 92: 223. 1946. TYPE: *Sideropogon lasianthum* (Bureau & K. Schum.) Pichon [≡ *Cuspidaria lasiantha* (Bureau & K. Schum.) L. G. Lohmann].

Lianas, without dimorphic juvenile growth, without strong odor; stems with 4 phloem wedges in cross-section, pith solid; branchlets cylindrical, pubescent, with sparse lenticels, with interpetiolar glands, with (without) discontinuous interpetiolar ridge, with epidermis not peeling; prophylls of axillary buds triangular and minute, without glands. Leaves simple or 2- or 3-foliolate (biternately compound in *Cuspidaria inaequalis*), terminal leaflet often replaced by a simple tendril, tendrils without adhesive disks, without uncinate apices; leaflets with glands grouped in axils of veins or sparsely distributed over lamina, without pellucid punctations, with or without domatia, petiolules not articulated; petiole cylindrical, never modified into a tendril, not articulated. Inflorescence terminal and/or axillary, a compound thyrse. Flowers zygomorphic, pentamerous; calyx cupular, shortly 5-lobed, 5-apiculate, or 5-aristate, membranaceous, puberulous or villose externally, with glands clustered near margins; corolla magenta, pink, or red, without nectar guides, infundibuliform (tubular in *C. cinerea*), straight in tube, membranaceous, glabrous externally (villose in *C. cinerea*), without glands, lobes 5, imbricate; stamens 4, with well-developed filaments, included, anthers glabrous, thecae forward-curved, pollen in tetrads, colpate, with exine psilate; ovary sessile, smooth and lepidote externally, ovules in 2 series on each placenta, stigma rhombic, glabrous; disk annular. Capsules linear, flattened, straight, coriaceous, with valves 2, puberulous, with lenticels, without glands, with or without wings, smooth except with midrib frequently developed into 2 longitudinal ridges, with calyx caducous; seeds winged, with body smooth and glabrous, wings hyaline, linear. Figure 13C–E.

Number of species, distribution, and habitat. *Cuspidaria* includes 19 species found in wet to dry forest and cerrado vegetation from Mexico to Argentina and Paraguay.

Cuspidaria is characterized by its pollen in tetrads (a synapomorphy of the genus), anthers with forward-curved thecae (also found in *Tynanthus* and some species of *Fridericia*), usually cuspidate or aristate calyx lobes, and capsules with the valves marginally thickened (also found in *Lundia* and *Tynanthus*) and the midrib divided into or bordered by two ridges (a synapomorphy of the genus) that are usually winged.

Cuspidaria as circumscribed here includes several species formerly included in *Arrabidaea*, as well as *Pyrostegia cinerea* Bureau & K. Schum (Fig. 13C–E). The relationship between *P. cinerea* and *Cuspidaria* was unexpected but is supported by molecular data (Lohmann, 2006), and these also share morphological characters.

In the vegetative state *Cuspidaria* is easily confused with *Fridericia*, *Lundia*, *Xylophragma*, and *Tynanthus*. *Cuspidaria* can be recognized by its leaflets with pinnate and straight-percurrent venation together with glands grouped in the axils of veins; this combination of characters is not found in the other genera. Additionally *Tynanthus* can be easily distinguished by its trifid tendrils plus a strong clove smell not found in any other genera.

1. Cuspidaria argentea (Wawra) Sandwith, Kew Bull. 9: 606. 1954 [1955]. *Arrabidaea argentea* Wawra, Oestr. Bot. Z. 29: 216. 1879. *Blepharitheca argentea* (Wawra) Pichon, Bull. Soc. Bot. France 92: 224. 1946. *Saldanhaea argentea* (Wawra) J. C. Gomes, Revista Brasil. Biol. 11: 51. 1951. TYPE: Brazil. Piauí: s. loc., s.d., *G. H. Schwarz s.n.* (holotype, W!, W as photo F neg. 32850 at MO-1692867!).

Habitat and distribution. This species is found in dry caatinga vegetation in eastern Brazil (Bahia, Ceará, Maranhão, Pernambuco, Piauí).

2. Cuspidaria bracteata (Baill. ex Bureau & K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Setilobus bracteatus* Baill. ex Bureau & K. Schum., Fl. Bras 8(2): 207. 1896. *Cuspidaria bracteata* Bureau ex Baill., Hist. Pl. 10: 29. 1888, nom. nud. invalid. TYPE: Brazil. Minas Gerais: Duas Pontes, 22 May 1882, *A. Glaziou 14119* (lectotype, designated here, P [no #] not seen, P as photocopy at MO-2692711!; isolectotypes, C not seen, C as photos F neg. 22114 at MO-1185530! and MO-1693056!, K [barcode] K000402986!, K as photocopy at MO-2904343!).

Nomenclatural note. The names *Setilobus bracteatus* and *Cuspidaria bracteata* were invalid in their citation, or implied citation, as published by Baillon (1888); the first name was validated later, but the latter name has never been validly published until now and confusion has surrounded both of these. These names both refer to the species treated here, but have also been extensively confused with the name *Saldanhaea bracteata*, which applies to a distinct species; for more information about this particular confusion, see the discussion of *C. cratensis* below. Baillon (1888: 29) explicitly cited only the name "Cuspidaria bracteata Bur.," without any further information and associated only with the description of the genus *Setilobus*, and this has been interpreted as an intent to describe the species *C. bracteata* and also the combination *S. bracteatus*. However, the description of *Setilobus* here cannot serve as a diagnosis for this species, because Baillon presented one description but explicitly noted that *Setilobus* included two species that he did not distinguish from each other: thus neither of these species was fully described or diagnosed here so neither name was validly published. And, Baillon's citation here of only the name "Cuspidaria bracteata" under the entry for *Setilobus* does not meet the requirements for valid publication of a combination or a new species of *Setilobus*, because the explicit association of the genus name with the epithet is required (McNeill et al., 2006, Art. 33.1). The name *S. bracteatus* was validly published only later, when Bureau and Schumann provided a diagnosis for it. They also cited material collected by Glaziou, but no collection number was given. There are two numbered, good-quality Glaziou collections at P that have been annotated as *Setilobus bracteatus*, and each has been considered the type of this name but these appear to be syntypes. *Glaziou 12986A* has been found only at P, lacks detailed locality data, and has two duplicates that have been annotated by P curators as the holotype and isotype. *Glaziou 14119* has one duplicate at P, annotated as the holotype by Gentry, and various duplicates at other herbaria plus detailed locality data. *Glaziou 14119* is here chosen as the type, following Gentry, and the specimen at P is chosen as the lectotype.

Habitat and distribution. This species is found in eastern Brazil (Minas Gerais), but its exact distribution is not well detailed yet, so its habitat cannot be reliably characterized.

3. Cuspidaria cinerea (Bureau ex K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Pyrostegia cinerea* Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 223. 1894. *Cuspidaria cinerea* (Bureau ex K. Schum.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 763. 2010, nom. nud. invalid. TYPE: Brazil. Minas Gerais, cultivated in Rio de Janeiro, at Quinta da Boa Vista, 28 Feb. 1882, *A. Glaziou 14124* (lectotype, designated by Pool [2008: 498], P [barcode] P00481542 image!, P [barcode] P00481542 as photo F neg. 22143 at MO-1693044!; isolectotypes, C!, P [barcode] P00481543 image!).

Habitat and distribution. This species is found in forest and especially campinas vegetation on white sand substrates in central Brazil (Amazonas, Minas Gerais).

4. Cuspidaria convoluta (Vell.) A. H. Gentry, Taxon 24(2/3): 343. 1975. *Bignonia convoluta* Vell., Fl. Flumin. 248. 1825 [1829]; Fl. Flumin. Icon. 6: tab. 31. 1827 [1831]. TYPE: tab. 31 in Vellozo, Fl. Flumin. Icon. 6, 1827 [1831] (lectotype, designated here).

Habitat and distribution. This species is found in dry forest vegetation in Bolivia, Paraguay, Brazil (Mato Grosso do Sul, Minas Gerais, Paraná, Rio Grande do Sul, Santa Catarina, São Paulo), and Argentina (Corrientes, Misiones), and is occasionally cultivated elsewhere.

5. Cuspidaria cratensis (J. C. Gomes) A. H. Gentry ex L. G. Lohmann, comb. nov. Basionym: *Saldanhaea cratensis* J. C. Gomes, Arch. Jard. Bot. Rio de Janeiro 9: 227. 1949. TYPE: Brazil, Ceará: Estrada de Fortaleza a Crato, 3 Aug. 1948, *A. P. Duarte 1256* (holotype, RB-68295 [barcode] 536907!; isotype, RB-68295 [barcode] 537292!).

Saldanhaea bracteata Bureau & K. Schum., Fl. Bras. 8(2): 253. 1896 [1897], non *Cuspidaria bracteata* (Bureau & K. Schum.) L. G. Lohmann. TYPE: Brazil. s. loc., s.d., *A. Glaziou 11125* (not located).

Nomenclatural note. The oldest name for this species is *Saldanhaea bracteata*, but that name cannot be transferred into *Cuspidaria* because the name *C. bracteata* is published here for a different species; the name *C. bracteata* is used here for the species to which that name has been previously applied in sched. The next oldest name for this species is *S. cratensis*, which is used here as the basionym for the combination in *Cuspidaria*; the name *C. cratensis* was used by Gentry for this species in sched., but never actually published by him. In the protologue of *S. bracteata*, only one collection, *Glaziou 11125*, was cited. This has not been located

so far, and further study is needed to resolve the typification of this name. In the meantime, the identity of this name is indicated by additional Glaziou collections that were also annotated as *S. bracteata*, both apparently around the time of the publication of this name and by Gentry: *Glaziou 9956*, P not seen, P as photocopy at MO-2904511!; *Glaziou 11222*, C not seen, C as photo F neg. 22115 at MO-1693047).

Bureau and Schumann (1896) described and distinguished two Bignoniaceae species in two different genera that each start with the letter S, and both species were given the epithet "bracteata." These species are *Saldanhaea bracteata* and *Setilobus bracteatus*, and both species are here classified in *Cuspidaria*. These species are distinct morphologically, ecologically, and geographically, but they have been extensively confused, apparently due mainly to nomenclatural confusion between their names. This confusion has resulted in part from their superficially similar published names, and in part from their informal inclusion by various taxonomists in *Cuspidaria* under the same unpublished name "Cuspidaria bracteosa" used for both species These unpublished names in *Cuspidaria* were based on two different basionyms but have the same parenthetical authors and thus appear to be the same name. This unpublished *Cuspidaria* name has been annotated on many herbarium specimens of both species by people who did not realize that two different basionyms were involved here. The species *Setilobus bracteatus* can be recognized by its well-developed inflorescence bracts and foliaceous prophylls, is found in Minas Gerais in southeastern Brazil, and is here called *C. bracteatus*; the species *Saldanhaea bracteatus* has fewer smaller inflorescence bracts and prophylls, is found in northeastern Brazil, and is here called *C. cratensis*.

Habitat and distribution. This species is found in dry caatinga vegetation in northeastern Brazil (Ceará, Paraíba, Piauí, Rio Grande do Norte).

6. **Cuspidaria emmonsii** A. H. Gentry, Novon 2(2): 160. 1992. TYPE: Peru. Ucayali: Coronel Portillo, bosque von Humboldt, Km. 86, Pucallpa–Tingo María rd., 270 m, 8°40′S, 75°0′W, 9 Feb. 1981, *A. H. Gentry, K. Young, S. Libenson, M. Olsen & T. Trucios 31126* (holotype, MO-2946100!; isotypes, AMAZ not seen, USM not seen).

Habitat and distribution. This species is found in wet forest vegetation in Peru (Cusco, Madre de Dios, Ucayali), Bolivia, and Brazil (Amazonas).

7. **Cuspidaria floribunda** (DC.) A. H. Gentry, Brittonia 25(3): 232. 1973. *Adenocalymma floribundum* DC., in A. DC., Prodr. 9: 201. 1845. *Blepharitheca floribunda* (DC.) Pichon, Bull. Soc. Bot. France 92: 224. 1946. *Saldanhaea floribunda* (DC.) Sandwith, Kew Bull. 22: 408. 1968. TYPE: Bolivia. Santa Cruz, s.d., *A. d'Orbigny 583* (holotype, P [barcode] P00481529!; isotype, G-DC!).

Habitat and distribution. This species is found rather frequently in dry to wet forest vegetation in eastern Panama, Colombia (Chocó), Ecuador, Peru (Cusco, Huánuco, Junín, Loreto, Madre de Dios, Pasco, San Martín, Ucayali), Bolivia, and Brazil (Acre, Amazonas, Distrito Federal, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Rondônia, São Paulo).

8. **Cuspidaria inaequalis** (DC. ex Splitg.) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 272. 2008. *Bignonia inaequalis* DC. ex Splitg., Tijdschr. Naturl. Gescheid. 9: 6. 1842. *Pleonotoma inaequalis* (DC. ex Splitg.) Miers, Proc. Roy. Hort. Soc. London 3: 184. 1863. *Arrabidaea inaequalis* (DC. ex Splitg.) Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 214. 1894. *Tetrastichella inaequalis* (DC. ex Splitg.), Bull. Soc. Bot. France 92: 223. 1946. TYPE: Suriname. River Parae, Mar., *O. Berklak s.n.* (holotype, P [barcode] P00468532!).

Habitat and distribution. This species is widely and rather frequently found in evergreen lowland to premontane forest vegetation (Gentry, 1997) in Mexico (Chiapas, Veracruz), Belize, Panama, Colombia (Amazonas, Antioquia, Caquetá, Meta, Vaupés), Venezuela (Amazonas, Anzoátegui, Bolívar, Delta Amacuro, Sucre), Trinidad and Tobago, Guyana, Suriname, French Guiana, Peru (Madre de Dios, San Martín, Ucayali), and Brazil (Acre, Amazonas, Maranhão, Mato Grosso, Pará, Rondônia).

9. **Cuspidaria lachnaea** (Bureau) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 272. 2008, as "*lachanea*." *Cremastus lachnaeus* Bureau, Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 1893: 101. 1893 [1894]. *Arrabidaea lachnaea* (Bureau) Sandwith, Kew Bull. 22: 416. 1968. TYPE: Brazil. Piauí: s. loc., 1839, *G. Gardner 2464* (lectotype, designated here, P [barcode] P00468533!, P [barcode] P00468533 as photocopy at MO-2692757!; isolectotypes, P [barcode] P00468534!, P [barcode] P00468535!, P [barcode] P00468536!, W not seen, W as photo F neg. 32860 at MO-1692942!).

Nomenclatural note. Two syntypes were cited in the protologue of this name, *Gardner 2464* and *Glaziou 9954*. The collection *Glaziou 9954* has not been located, thus the collection *Gardner 2464* is here designated as the type. This collection has various duplicates and the best quality material is here chosen as the lectotype.

Habitat and distribution. This species is found rather widely but infrequently in semideciduous forest (Gentry, 1997), cerrado vegetation, and on rocky outcrops in Venezuela (Amazonas, Apure, Barinas, Bolívar, Táchira), Bolivia, and Brazil (Ceará, Goiás, Maranhão, Minas Gerais, Piauí).

10. Cuspidaria lasiantha (Bureau & K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea lasiantha* Bureau & K. Schum., Fl. Bras. 8(2): 72. 1896. *Sideropogon lasianthum* (Bureau & K. Schum.) Pichon, Bull. Soc. Bot. France 92: 223. 1946. *Fridericia lasiantha* (Bureau & K. Schum.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. Minas Gerais: Caraça, 10 June 1884, *A. Glaziou 15254* (holotype, P [barcode] P00468537!; isotype, P [barcode] P00481525!).

Habitat and distribution. This species is found in Atlantic forest vegetation in eastern Brazil (Minas Gerais, Rio de Janeiro).

11. Cuspidaria lateriflora (Mart.) DC., in A. DC., Prodr. 9: 179. 1845. *Tecoma lateriflora* Mart., Flora 24(2, Beibl.): 51. 1841. *Saldanhaea lateriflora* (Mart.) Bureau, Adansonia 8: 355, tab. 11, 12. 1868. TYPE: Brazil. Mato Grosso: Cuiabá, Morro do Ernesto, Sep.–Oct. 1832, *Mart. Herb. Fl. Bras. 532* (lectotype, designated here, BR-876527!; isolectotypes, BR-876494!, BR-876560!, G-DC!, G-DC as photo F neg. 7671 at MO-1692946!, M-86408!, NY [barcode] NY00328963!).

Nomenclatural note. Several specimens of the type collection are deposited in the Martius Herbarium that is now at BR, with no indication by Martius of which is the type. The most representative and complete of these specimens is here chosen as the lectotype.

Habitat and distribution. This species is found in dry to wet forest vegetation in Peru (Madre de Dios, Puno), Bolivia, Paraguay, and Brazil (Acre, Amazonas, Ceará, Distrito Federal, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraíba, Pernambuco, Rio de Janeiro, Rondônia).

12. Cuspidaria multiflora DC., in A. DC., Prodr. 9: 179. 1845. TYPE: Brazil. Bahia: Caetité, Oct., *C. F. P. von Martius s.n.* (lectotype, designated here, M-86411!, M as photo F neg. 20460 at MO-1692947!; isolectotypes, G-DC!, M-86410!, M as photo F neg. 20460 at MO-1692947!).

Nomenclatural note. In the protologue de Candolle noted that the type of this name was deposited in M. There are two Martius collections there that correspond to this material, one identified as *Cuspidaria multiflora* and the other as *Lundia multiflora*; de Candolle cited both names in the protologue as names that had been used for this species, though only the name *C. multiflora* was accepted and validly published. Therefore these seem to be syntypes and a lectotype is chosen here. The lectotype is the specimen originally identified as *C. multiflora*, which has better flowers and was photographed with the photos distributed widely by the Field Museum.

Habitat and distribution. This species is found in dry caatinga vegetation in eastern Brazil (Bahia, Minas Gerais).

13. Cuspidaria octoptera A. H. Gentry, Ann. Missouri Bot. Gard. 64(2): 314. 1977 [1978]. TYPE: Brazil. s. loc., s.d., *J. Nadeaud s.n.* (holotype, P [barcode] P00481523!; isotypes, MO-4939540!, P [barcode] P00481524!)

Habitat and distribution. This species is found in dry forest vegetation in eastern Brazil (Minas Gerais, Pernambuco, Rio de Janeiro, São Paulo).

14. Cuspidaria pulchella (Cham.) K. Schum., Nat. Pflanzenfam. 4(3b): 216. 1894. *Bignonia pulchella* Cham., Linnaea 7: 663. 1832 [1833]. *Arrabidaea pulchella* (Cham.) Bureau, in J. E. B. Warming, Lagoa Santa 270. 1892. *Paracarpaea pulchella* (Cham.) Pichon, Bull. Soc. Bot. France 92: 223. 1946. *Fridericia pulchella* (Cham.) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1606. 2008, nom. nud. invalid. *Fridericia pulchella* (Cham.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Brazil. s. loc., s.d., *F. Sellow 5349* (holotype, LE not seen; isotypes, B-18453†, B as photo F neg. 18453 at MO-1692853!, K!).

Habitat and distribution. This species is found in cerrado vegetation in Paraguay and Brazil (Mato Grosso do Sul, Minas Gerais, Paraná, São Paulo).

15. Cuspidaria pulchra (Cham.) L. G. Lohmann, comb. nov. Basionym: *Bignonia pulchra* Cham., Linnaea 7: 708. 1832 [1833]. *Cremastus pulcher* (Cham.) Bureau, Kongel. Danske Vidensk. Selsk. Skr., Naturvidensk. Math. Afd. 6: 270. 1892. *Arrabidaea pulchra* (Cham.) Sandwith, Kew Bull. 22: 416. 1968. *Cuspidaria pulchra* (Cham.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 764. 2010, nom. nud. invalid. TYPE: Brazil. s. loc., s.d., *F. Sellow 1609* (holotype, LE not seen; isotypes, B†, B as photo F neg. 18488 at MO-1692904!, K!, NY [barcode] NY00313148!, NY [barcode] NY00313148 as photocopy at MO-2927266!).

Habitat and distribution. This species is found in cerrado vegetation and on dry rocky outcrops in Bolivia and Brazil (Bahia, Ceará, Distrito Federal, Goiás, Maranhão, Mato Grosso, Minas Gerais, Pará, Rio de Janeiro, São Paulo).

16. Cuspidaria sceptrum (Cham.) L. G. Lohmann, comb. nov. Basionym: *Bignonia sceptrum* Cham., Linnaea 7: 710. 1832 [1833]. *Petastoma sceptrum* (Cham.) Miers, Proc. Roy. Hort. Soc. 3: 195. 1863. *Cremastus sceptrum* (Cham.) Bureau & K. Schum., Fl. Bras. 8(2): 216. 1896. *Arrabidaea sceptrum* (Cham.) Sandwith, Kew Bull. 22: 416. 1968. *Cuspidaria sceptrum* (Cham.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 764. 2010, nom. nud. invalid. TYPE: Brazil. Chapada, 1814–1831, *F. Sellow s.n.* (holotype, LE not seen; isotypes, presumably B†, US-282523 image!, US-286309 image!).

Nomenclatural note. The collection locality of the Sellow specimen cited in the protologue was given simply as Chapada. This species' range includes several different places that are each called Chapada, and it is unknown in which Chapada this was collected.

Habitat and distribution. This species is found in cerrado vegetation and on dry rocky outcrops in Bolivia and Brazil (Bahia, Distrito Federal, Goiás, Mato Grosso, Minas Gerais, Paraná, Rondônia, São Paulo).

17. Cuspidaria simplicifolia DC., Biblioth. Universelle Genève, sér. 2, 17: 125. 1838. TYPE: Brazil. Bahia: Sierra d'Apurna près le Rio Saint-François, 1838, *J. S. Blanchet 2801* (holotype, G-DC [barcode] G00133399!; isotypes, MO-1998979!, NY [barcode] NY00328767!, P [barcode] P00608082!, P [barcode] 608083!, P [barcode] P00608084!).

Cuspidaria puberula Mart. ex DC., in A. DC., Prodr. 9: 178. 1845, syn. nov. *Panterpa puberula* (Mart. ex DC.) Miers, Proc. Roy. Hort. Soc. London 3: 196. 1863. *Arrabidaea puberula* (Mart. ex DC.) Bureau, Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 1893: 99. 1893 [1894]. *Blepharitheca puberula* (Mart. ex DC.) Pichon, Bull. Soc. Bot. France 92: 224. 1946. *Saldanhaea puberula* (Mart. ex DC.) J. C. Gomes, Revista Brasil. Biol. 11: 51. 1951. TYPE: Brazil. Bahia: Monte Santo, 1 Apr., *C. F. P. von Martius 2269* (holotype, G-DC!; isotypes, M not seen, M as photo F neg. 20443 at K! and at MO-1692851!).

Nomenclatural note. Study of the type specimens shows the names *Cuspidaria simplicifolia* and *C. puberula* apply to the same species, and these names are accordingly synonymized here.

Habitat and distribution. This species is found in dry forest and caatinga vegetation in Bolivia and Brazil (Bahia, Ceará, Minas Gerais, Pernambuco, Piauí, Rio de Janeiro, São Paulo).

18. Cuspidaria subincana A. H. Gentry, Ann. Missouri Bot. Gard. 63(1): 52, fig. 1b. 1976. TYPE: Brazil. Amazonas: 2–5 km N of Manaus–Itacoatiara Rd., near Preto da Eva, Km. 79, 100–200 m, 24 Nov. 1974, *A. H. Gentry 12825* (holotype, INPA not seen; isotypes, MG not seen, MO-2251768!, RB-185814 [barcode] 536879!, RB-185814 [barcode] 537282!).

Habitat and distribution. This species is found in wet premontane forest vegetation (Gentry, 1997) in Colombia (Meta), Venezuela (Bolívar), Suriname, and Brazil (Amazonas, Rondônia).

19. Cuspidaria weberbaueri (Sprague) A. H. Gentry, Brittonia 25(3): 233. 1973. *Arrabidaea weberbaueri* Sprague, Bot. Jahrb. Syst. 42: 175. 1908. *Saldanhaea weberbaueri* (Sprague) Sandwith, Kew Bull. 22: 408. 1968. TYPE: Peru. Junín: Tarma, La Merced in Chanchamayothal, 1000 m, s.d., *A. Weberbauer 1934* (holotype, presumably B†; isotype, G-8923!, G as photo F neg. 26177 at MO-1692865!).

Nomenclatural note. Further study is needed before the typification of this species can be clarified.

Habitat and distribution. This species is found in dry forest vegetation in the Huallaga and Chanchamayo valleys of central Peru (Junín, San Martín; Gentry, 1992a).

VII. Dolichandra Cham., Linnaea 7: 657. 1832 [1833], emend. L. G. Lohmann. TYPE: *Dolichandra cynanchoides* Cham.

Macfadyena A. DC., Prodr. 9: 179. 1845, syn. nov. TYPE: *Macfadyena uncinata* (G. Mey.) A. DC. [= *Dolichandra uncata* (Andrews) L. G. Lohmann].

Doxantha Miers, Proc. Roy. Hort. Soc. London 3: 189. 1863. TYPE: *Doxantha unguis-cati* (L.) Miers [≡ *Dolichandra unguis-cati* (L.) L. G. Lohmann].

Melloa Bureau, Adansonia 8: 379. 1868, syn. nov. TYPE: *Melloa populifolia* (DC.) Bureau (lectotype, designated by Baillon [1888: 26]). [= *Dolichandra quadrivalvis* (Jacq.) L. G. Lohmann].

Parabignonia Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 229. 1894, syn. nov. TYPE: *Parabignonia maximillianii* (Mart. ex DC.) Bureau ex K. Schum. [= *Dolichandra unguiculata* (Vell.) L. G. Lohmann].

Paradolichandra Hassl., Bull. Herb. Boissier, sér. 2, 7: 718. 1907, syn. nov. TYPE: *Paradolichandra chodatii* Hassl. [≡ *Dolichandra chodatii* (Hassl.) L. G. Lohmann].

Microbignonia Kraenzl., Notizbl. Königl. Bot. Gart. Berlin 6: 380. 1915. TYPE: *Microbignonia auristellae* Kraenzl. [= *Dolichandra unguis-cati* (L.) L. G. Lohmann].

Batocydia Mart. ex Britton, Sci. Surv. Porto Rico & Virgin Islands 6: 194. 1925, nom. illeg. superfl. TYPE: *Batocydia unguis-cati* (L.) Mart. ex Britton, as "*Batocydia unguis*." [≡ *Dolichandra unguis-cati* (L.) L. G. Lohmann].

Lianas, with dimorphic juvenile growth, without strong odor; stems with multiple dissected phloem wedges in cross-section, pith solid; branchlets cylindrical (tetragonal), glabrous, with or without lenticels, with or without interpetiolar glands, with (without) discontinuous interpetiolar ridge, with epidermis not peeling; prophylls of axillary buds subulate, without glands. Leaves 2- or 3-foliolate, terminal leaflet often replaced by a trifid tendril, tendrils without adhesive disks, with uncinate apices; leaflets chartaceous, with glands sparsely distributed over lamina, without pellucid punctations, without domatia, petiolules not articulated; petiole cylindrical, never modified into a tendril, not articulated. Inflorescence axillary, a congested cyme or thyrse (umbellate groups of cymes). Flowers zygomorphic, pentamerous; calyx cupular and irregularly lobed or spathaceous, membranaceous, glabrous to puberulent externally, without glands; corolla yellow or red, without nectar guides, tubular or infundibuliform, straight in tube, membranaceous, glabrous externally, without glands, lobes 5, imbricate; stamens 4, with well-developed filaments, included or exserted, anthers glabrous, thecae straight, pollen in monads, colpate, with exine psilate; ovary sessile, smooth and glabrous to puberulous externally, ovules in multiple (1) series on each placenta, stigma rhombic, glabrous; disk annular and lobed. Capsules linear (elliptic), flattened or inflated, straight, coriaceous (woody), with valves 2 and partially divided longitudinally or 4, glabrous, with or without lenticels, without glands, without wings, smooth, with calyx persistent; seeds winged, with body smooth and glabrous, wings hyaline, linear.

Number of species, distribution, and habitat. *Dolichandra* includes eight species found in wet to dry forest vegetation from the southeastern U.S.A., Mexico, and the Antilles to Argentina.

Dolichandra is circumscribed broadly here, to include *Parabignonia*, *Melloa*, and *Macfadyena*. These genera have long been considered related, but were separated based primarily on flower color (red in *Dolichandra*, yellow in *Macfadyena* and *Melloa*, and red or yellow in *Parabignonia*) and fruit shape (elliptic in *Melloa* and *Dolichandra*, vs. linear in *Macfadyena* and *Parabignonia*). For example, Gentry (1973a: 237) observed "Although *Melloa* is monotypic and closely related to *Macfadyena*, I prefer to retain it as a distinct genus for the present. Its thick-walled, elliptic-oblong fruit, with each valve breaking in the middle at dehiscence, is certainly different from the linear, thin-walled fruits of *Macfadyena* from which it must have been derived." However, these four genera form a strongly supported monophyletic group in the phylogenetic hypothesis of the tribe Bignonieae (Lohmann, 2006; Fig. 2), and this clade is here treated as a single genus. This broadly circumscribed *Dolichandra* is distinguished by its multiple dissected phloem wedges (Santos, 1995; a synapomorphy of the genus), uncinate or clawlike tendrils (another synapomorphy), colpate pollen with a psilate exine (Gentry & Tomb, 1979), and 4-parted fruits (another synapomorphy). Additionally *Dolichandra* is characterized by dimorphic growth with the juvenile form attaching by its uncinate tendrils, subulate prophylls of the axillary buds, congested-cymose inflorescences, and a lobed nectar disk. As noted previously, flower color and fruit shape are highly homoplasious in Bignonieae, and these vary markedly within *Dolichandra*.

1. Dolichandra chodatii (Hassl.) L. G. Lohmann, comb. nov. Basionym: *Paradolichandra chodatii* Hassl., Bull. Herb. Boissier, sér. 2, 7: 720. 1907. *Parabignonia chodatii* (Hassl.) A. H. Gentry, Ann. Missouri Bot Gard. 66(4): 785. 1979 [1980]. *Dolichandra chodatii* (Hassl.) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1602. 2008, nom. nud. invalid. *Dolichandra chodatii* (Hassl.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 764. 2010, nom. nud. invalid. TYPE: Paraguay. Sierra de Amambay, Picada Esperanza, 1907–1908, *E. Hassler 10281* (holotype, G!, G as photo F neg. 26200 at MO-1693014!; isotype, NY-328894!).

Habitat and distribution. This species is found in moist to dry forest vegetation in eastern Bolivia, Paraguay, southern Brazil (Paraná), and northern Argentina (Jujuy, Salta).

2. Dolichandra cynanchoides Cham., Linnaea 7: 658. 1832 [1833]. *Macfadyena cynanchoides* (Cham.) Morong, Ann. New York Acad. Sci. 7: 187. 1893. TYPE: Brazil. s. loc., s.d., *F. Sellow 942* (holotype, LE not seen; isotype, B†, B as F neg. 18431 at MO-1692954!).

Habitat and distribution. This species is found in dry to wet forest vegetation in Bolivia, Paraguay, Brazil (Paraná, Rio Grande do Sul, Santa Catarina), Uruguay, and Argentina (Buenos Aires, Catamarca, Chaco, Córdoba, Corrientes, Entre Ríos, Formosa, Jujuy, Misiones, Salta, Santa Fe, Tucumán), and is cultivated in tropical and warm temperate regions worldwide.

3. Dolichandra dentata (K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Macfadyena dentata* K. Schum., Nat. Pflanzenfam. 4(3b): 227. 1894. *Dolichandra dentata* (K. Schum.) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1602. 2008, nom. nud invalid. *Dolichandra dentata* (K. Schum.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 764. 2010, nom. nud. invalid. TYPE: Brazil. Betw. Campo Novo & Palmeira, s.d., *G. Niederlein 188* (holotype, B†); Uruguay, Concepción del Uruguay, Nov 1877, *P. G. Lorentz s.n.* (lectotype, designated here, K [barcode] K000449794 image!).

Nomenclatural note. Schumann (1894) reported that the type of *Macfadyena dentata* was from Brazil without further details, but several collections of this species were listed by Bureau and Schumann (1896: 292–293). Only one of these, a collection by Niederlein, is from Brazil and this is assumed to be the type of this species; however, a specimen of this presumably deposited at B was destroyed and no duplicates have been located. The other specimens cited by Bureau and Schumann were from Uruguay near Villa de Minas, *Sello 276* and *Sello 853*; from Uruguay along the Rio Santa Luzia, *Kuntze s.n.*; from Uruguay near Concepcion, *Lorentz s.n.*; and from an undesignated location along the Rio Paraná, *Tweedie s.n.* The last two of these collections have been located at K, and the collection by Lorentz is more complete and representative and is here chosen as the lectotype.

Habitat and distribution. This species is found in humid to dry forest vegetation in Paraguay, Brazil (Paraná, Rio Grande do Sul, Santa Catarina), Uruguay, and Argentina (Buenos Aires, Córdoba, Corrientes, Entre Ríos, Misiones).

4. Dolichandra quadrivalvis (Jacq.) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 273. 2008. *Bignonia quadrivalvis* Jacq., Fragm. Bot. 37, tab. 40, fig. 3. 1800 [1809]. *Melloa quadrivalvis* (Jacq.) A. H. Gentry, Brittonia 25(3): 237. 1973, as "quadrivalva." TYPE: tab. 40, fig. 3 in Jacq., Fragm. Bot. 37, 1800 [1809] (lectotype, designated here).

Nomenclatural note. No Jacquin collections of this species have been found, in spite of two searches throughout the W herbarium where he worked. The illustration presented in the original description of this species is diagnostic and is here selected as the lectotype.

Habitat and distribution. This species is found widely in dry to wet forests and particularly in seasonal lowland forest vegetation, in Mexico (Chiapas, Guerrero, Hidalgo, Jalisco, Michoacán, Oaxaca, Puebla, Querétaro, Tamaulipas, Veracruz, Yucatán), Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Colombia (Atlántico, Bolívar, César, Cundinamarca, Magdalena, Tolima), Venezuela (Anzoátegui, Apure, Aragua, Barinas, Cojedes, Distrito Federal, Guárico, Lara, Monagas, Portuguesa, Zulia), Guyana, Peru (Madre de Dios, Ucayali), Bolivia, Paraguay, Brazil (Bahia, Ceará, Espírito Santo, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraíba, Paraná, Pernambuco, Rio Grande do Sul, Rondônia, Roraima, Santa Catarina, São Paulo), Uruguay, and Argentina (Chaco, Corrientes, Entre Ríos, Jujuy, Misiones, Salta).

5. Dolichandra steyermarkii (Sandwith) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 273. 2008. *Parabignonia steyermarkii* Sandwith, Bol. Soc. Venez. Ci. Nat. 26: 446, fig. 11. 1966. TYPE: Venezuela. Bolívar: Km. 119 S of El Dorado, 1030 m, 12 Jan. 1964, *J. A. Steyermark et al. 93003* (holotype, K!; isotypes, F-1653425 image!, S not seen, VEN not seen).

Habitat and distribution. This species is found in wet and cloud forest vegetation (Gentry, 1997) in Costa Rica, Panama, Venezuela (Bolívar, Delta Amacuro, Sucre), Guyana, Suriname, French Guiana, Ecuador, Peru (Loreto), and Brazil (Acre, Pará).

6. Dolichandra uncata (Andrews) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 273. 2008. *Bignonia uncata* Andrews, Bot. Repos. 8: tab. 530. 1808. *Spathodea uncata* (Andrews)

Spreng., Syst. Veg. 2: 835. 1825. *Doxantha uncata* (Andrews) Miers, Proc. Roy. Hort. Soc. London 3: 190. 1863. *Macfadyena uncata* (Andrews) Sprague & Sandwith, Receuil Trav. Bot. Néerl. 34: 215. 1937. TYPE: tab. 530 in Bot. Reposit. 8, 1808, illustration based on a cultivated specimen from Cayenne [French Guiana] brought to England by Lord Seaforth (lectotype, designated by Howard [1989: 325]).

Habitat and distribution. This species is found widely and frequently in swampy and riverside forest vegetation (Gentry, 1997) in Mexico (Quintana Roo, Tabasco, Veracruz), the Greater Antilles (Cuba), Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Antioquia, Atlántico, Bolívar, Boyacá, Chocó, Córdoba, La Guajira, Magdalena, Meta, Valle del Cauca), Venezuela (Amazonas, Apure, Barinas, Bolívar, Carabobo, Delta Amacuro, Guárico, Miranda, Monagas, Sucre, Yaracuy, Zulia), Trinidad and Tobago, Guyana, Suriname, French Guiana, Ecuador, Peru (Amazonas, Huánuco, Loreto, Madre de Dios, Puno, San Martín, Ucayali), Bolivia, Paraguay, Brazil (Amapá, Amazonas, Maranhão, Mato Grosso, Minas Gerais, Pará, Paraná, Rio de Janeiro, Rio Grande do Sul, São Paulo), Uruguay, and Argentina (Buenos Aires, Chaco, Corrientes, Formosa, Jujuy, Misiones).

7. Dolichandra unguiculata (Vell.) L. G. Lohmann, comb. nov. Basionym: *Bignonia unguiculata* Vell., Fl. Flumin. 248. 1825 [1829]; Fl. Flumin. Icon. 6: tab. 33. 1827 [1831]. *Doxantha unguiculata* (Vell.) Miers, Proc. Roy. Hort. Soc. London 3: 190. 1863. *Parabignonia unguiculata* (Vell.) A. H. Gentry, Taxon 24(4): 343. 1975. *Dolichandra unguiculata* (Vell.) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1603. 2008, nom. nud. invalid. *Dolichandra unguiculata* (Vell.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 764. 2010, nom. nud. invalid. TYPE: tab. 33 in Vellozo, Fl. Flumin. Icon. 6, 1827 [1831] (lectotype, designated here).

Habitat and distribution. This species is found in Atlantic forest vegetation in eastern Brazil (Bahia, Espírito Santo, Minas Gerais, Paraná, Rio de Janeiro, São Paulo).

8. Dolichandra unguis-cati (L.) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 273. 2008. Basionym: *Bignonia unguis-cati* L., Sp. Pl. 2: 623. 1753. *Doxantha unguis-cati* (L.) Miers, Proc. Roy. Hort. Soc. London 3: 189. 1863, as "*unguis*." *Batocydia unguis-cati* (L.) Mart. ex Britton, Brooklyn Bot. Gard. Mem. 1: 90. 1918, nom. nud invalid. *Batocydia unguis-cati* (L.) Mart. ex Britton, Sci. Surv. Porto Rico & Virgin Islands 6(2): 194. 1925, nom. illeg. superfl., as "*unguis*." *Macfadyena unguis-cati* (L.) A. H. Gentry, Brittonia 25(3): 236. 1973. TYPE: tab. 94 in Plumier, Descr. Pl. Amer., 1693 (lectotype, designated by Nasir [1979: 18]).

Habitat and distribution. This species is widely and commonly found in dry to humid lowland forests in the southeastern United States (Florida), Mexico (Baja California Sur, Campeche, Chiapas, Guerrero, México, Michoacán, Morelos, Nayarit, Nuevo León, Oaxaca, Puebla, Querétaro, Quintana Roo, San Luis Potosí, Sinaloa, Sonora, Tabasco, Tamaulipas, Veracruz, Yucatán), the Antilles (Antigua, Bahamas, Barbados, Barbuda, Cuba, Dominica, Dominican Republic, Grenada, the Grenadines, Guadeloupe, Haiti, Martinique, Montserrat, Puerto Rico, Saba, San Andrés-Providencia, St. Eustatius, St. Lucia, St. Martin, St. Vincent, Virgin Islands), Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Antioquia, Atlántico, Bolívar, Boyacá, Caldas, César, Chocó, Córdoba, Cundinamarca, Guaviare, La Guajira, Magdalena, Meta, Sucre), Venezuela (Amazonas, Anzoátegui, Apure, Aragua, Barinas, Bolívar, Carabobo, Cojedes, Delta Amacuro, Distrito Federal, Falcón, Guárico, Lara, Mérida, Miranda, Monagas, Nueva Esparta, Portuguesa, Sucre, Yaracuy, Zulia), Trinidad and Tobago, Guyana, Suriname, French Guiana, Ecuador, Peru (Cusco, Huánuco, Junín, Loreto, Madre de Dios, Pasco, Puno, San Martín, Ucayali), Bolivia, Paraguay, Brazil (Amazonas, Bahia, Ceará, Distrito Federal, Espírito Santo, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraíba, Paraná, Pernambuco, Rio de Janeiro, Rio Grande do Sul, Rondônia, Roraima, Santa Catarina, São Paulo, Sergipe), Uruguay, and Argentina (Buenos Aires, Catamarca, Chaco, Córdoba, Corrientes, Entre Ríos, Formosa, Jujuy, Misiones, Salta, Santa Fe, Tucumán), and is cultivated in warm regions worldwide and is an invasive weed in eastern Australia. This is the most commonly collected species of this tribe.

VIII. Fridericia Mart., Nova Acta Phys.-Med. Acad. Caes. Leop.-Carol. Nat. Cur. 13(2): 7. 1827, emend. L. G. Lohmann. TYPE: *Fridericia speciosa* Mart. (lectotype, designated by Schumann [1894: 222]).

Arrabidaea DC., Biblioth. Univers. Genève, sér. 2, 17: 126. 1838, syn. nov. TYPE: *Arrabidaea rego* (Vell.) DC. [≡ *Fridericia rego* (Vell.) L. G. Lohmann].

Pentelesia Raf., Sylva Tellur. 146. 1838. TYPE: *Pentelesia discolor* Raf., nom. superfl. illeg. [≡ *Fridericia carichanensis* (Kunth) L. G. Lohmann].

Vasconcellia Mart., Flora 24(2, Beibl.): 12. 1841, hom. illeg., syn. nov., non *Vasconcella* A. St. Hil. (1837), nom. superfl. illeg. TYPE: *Vasconcellia rego* (Vell.) Mart. [≡ *Fridericia rego* (Vell.) L. G. Lohmann].

Panterpa Miers, Proc. Roy. Hort. Soc. London 3: 195. 1863. TYPE: *Panterpa leucopogon* (Cham.) Miers [≡ *Fridericia leucopogon* (Cham.) L. G. Lohmann].

Petastoma Miers, Proc. Roy. Hort. Soc. London 3: 194. 1863. TYPE: *Petastoma samydoides* (Cham.) Miers [≡ *Fridericia samydoides* (Cham.) L. G. Lohmann].

Neomacfadya Baill., Hist. Pl. 10: 26. 1888. *Neomacfadyena*, orth. var. TYPE: *Neomacfadya podopogon* (DC.) Baill. ex K. Schum. [≡ *Fridericia podopogon* (DC.) L. G. Lohmann].

Paramansoa Baill., Hist. Pl. 10: 27. 1888. TYPE: *Paramansoa grosourdyana* Baill. [≡ *Fridericia grosourdyana* (Baill.) L. G. Lohmann].

Chasmia Schott ex Kuntze, Revis. Gen. Pl. 2: 479. 1891, nom. superfl. illeg., syn. nov. *Chasmia* Schott ex Spreng., Syst. Veg. 4(2): 409. 1827, nom. nud. invalid. TYPE: *Chasmia rego* (Vell.) Kuntze [≡ *Fridericia rego* (Vell.) L. G. Lohmann].

Stenosiphanthus A. Samp., Bol. Mus. Nac. Rio de Janeiro 12(3, 4): 84. 1936. TYPE: *Stenosiphanthus duckei* A. Samp. [= *Fridericia lauta* (Bureau & K. Schum.) L. G. Lohmann].

Scobinaria Siebert, Publ. Carnegie Inst. Wash. 522: 408. 1940. TYPE: *Scobinaria verrucosa* (Standl.) Seibert [= *Fridericia schumanniana* (Loes.) L. G. Lohmann].

Piriadacus Pichon, Bull. Soc. Bot. France 92: 225. 1946. *Alsocydia* Mart. ex J. C. Gomes, Revista Brasil. Biol. 11: 49. 1951, nom. superfl. illeg. TYPE: *Piriadacus erubescens* (DC.) Pichon [≡ *Fridericia erubescens* (DC.) L. G. Lohmann].

Lianas or shrubs, without dimorphic juvenile growth, without strong odor; stems with 4 phloem wedges in cross-section, pith solid; branchlets cylindrical, glabrous to pubescent, with or without lenticels, with (without) interpetiolar glands, with or without interpetiolar ridge, with epidermis not peeling; prophylls of axillary buds triangular and minute, without glands. Leaves 1- to 3-foliolate, terminal leaflet often replaced by a simple tendril, tendrils without adhesive disks, without uncinate apices; leaflets without glands or with glands sparsely distributed over lamina or grouped in axils of veins, without pellucid punctations, usually with domatia on abaxial surface, petiolules not articulated; petiole cylindrical, never modified into a tendril, not articulated. Inflorescence axillary and/or terminal, a thyrse or compound thyrse. Flowers zygomorphic, pentamerous; calyx cupular, tubular, or urceolate, shortly 5-lobed, 5-apiculate, or bilabiate, membranaceous or coriaceous, lepidote or puberulous externally, without glands or with solitary glands near margins; corolla magenta or pink (red, white), without nectar guides, tubular or infundibuliform, straight in tube, membranaceous or coriaceous, villose (glabrous) externally, without glands, lobes 5, imbricate; stamens 4, with well-developed filaments, included, anthers glabrous, thecae straight or forward-curved, pollen in monads, colpate, with exine psilate (reticulate in *Fridericia erubescens*); ovary sessile, smooth and lepidote externally, ovules in 1 series on each placenta, stigma elliptic, glabrous; disk annular. Capsules linear, flattened, straight, coriaceous, with valves 2, lepidote, with lenticels (without in *F. erubescens*), without glands, without wings (with wings in *F. erubescens*), smooth (tuberculate in *F. verrucosa*), with calyx caducous; seeds winged, with body smooth and glabrous, wings hyaline (opaque in *F. speciosa*), linear or elliptic. Figures 14, 15.

Nomenclatural note. Martius described the new genus *Fridericia* with two species and did not designate either of them as its type. Schumann recognized one species of *Fridericia* and synonymized these two names, which is here considered an effective lectotypification.

Number of species, distribution, and habitat. *Fridericia* includes 67 species found in wet to dry forest, cerrado, and caatinga vegetation from Mexico to Argentina and southern Brazil.

Fridericia is here circumscribed much more broadly than previously and is characterized by triangular and minute prophylls of the axillary buds, the presence of interpetiolar glands (Fig. 14F), simple tendrils, thyrsoid inflorescences (Fig. 14E), pink flowers, lepidote ovaries with a single series of ovules on each placenta, and lepidote lenticellate fruits that lack glands.

As previously circumscribed, *Fridericia* was monotypic and its relationships to other taxa in this tribe were unclear. In the phylogenetic hypothesis of tribe Bignonieae (Lohmann, 2006), *Fridericia* is nested within a clade that also includes many of the species that have been classified in *Arrabidaea*. *Arrabidaea* has long been the largest, most polymorphic, and most taxonomically confused genus of Bignonieae. Unsurprisingly, the phylogenetic analysis found that *Arrabidaea* in its previous circumscription was polyphyletic with its species distributed among four clades: *Fridericia–Arrabidaea* s. str., *Cuspidaria*, *Tanaecium*, and *Xylophragma*. The *Fridericia–Arrabidaea* s. str. clade is well supported and includes *A. rego* (Vell.) DC., the type of *Arrabidaea*, along with the majority of species that have been classified in *Arrabidaea* and the genera *Piridicus* and *Fridericia*. Of these *Fridericia* is the oldest name and is thus the name of this combined group. The other species previously included in *Arrabidaea* are here variously classified in *Tanae-*

cium (species with foliaceous or bromeliad-like prophylls of the axillary buds), *Cuspidaria* (species with forward-curved anthers), and *Xylophragma* (species with multiple series of ovules per placenta).

Relationships among species within *Fridericia* are still unclear. The phylogenetic hypothesis of Bignonieae (Lohmann, 2006) suggests that the species that were formerly separated in *Petastoma* and *Scobinaria* together form a monophyletic group, but no other groups are separated. The species sampling in this analysis is not broad or detailed enough to confidently identify lineages within *Fridericia*, and more detailed study is underway (Lohmann, 2003; Lohmann et al., in prep.).

1. Fridericia arthrerion (Mart.) L. G. Lohmann, comb. nov. Basionym: *Bignonia arthrerion* Mart., Flora 24(2, Beibl.): 47. 1841. *Distictis arthrerion* (Mart.) DC., in A. DC., Prodr. 9: 191. 1845. *Arrabidaea arthrerion* (Mart.) Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 213. 1894. *Fridericia arthrerion* (Mart.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 764. 2010, nom. nud. invalid. TYPE: Brazil. Mato Grosso: Cuiabá, Feb. 1833, *A. Silva Manso 18* (*Herb. Fl. Brasil. 515*) (holotype, M-86391!, M as photo K neg. 20437 at MO-1692771!; isotypes, BR-880472!, G-14139!, G-DC!, MO-2005583!, P [barcode] P00468550!).

Habitat and distribution. This species is found in dry forest vegetation in eastern Bolivia and southwestern Brazil (Mato Grosso).

2. Fridericia bahiensis (Schauer ex DC.) L. G. Lohmann, comb. nov. Basionym: *Vitex bahiensis* Schauer ex DC., in A. DC., Prodr. 11: 687. 1847. *Arrabidaea bahiensis* (Schauer ex DC.) Sandwith & Moldenke, Revista Sudamer. Bot. 4: 15. 1937. *Fridericia bahiensis* (Schauer ex DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 764. 2010, nom. nud. invalid. TYPE: Brazil. Bahia: Igreja Velha, 1841, *J. S. Blanchet 3274* (holotype, G-DC!; isotypes, F-876595 image!, G-14128!, P [barcode] P00468551!, P [barcode] P00468552!, P [barcode] P00468553!).

Habitat and distribution. This species is found in cerrado vegetation and on dry rocky outcrops in eastern Brazil (Bahia, Minas Gerais, Piauí, Rio de Janeiro).

3. Fridericia bracteolata (DC.) L. G. Lohmann, comb. nov. Basionym: *Bignonia bracteolata* DC., in A. DC., Prodr. 9: 157. 1845. *Arrabidaea bracteolata* (DC.) Sandwith, Receuil Trav. Bot. Néerl 34: 215. 1937. *Fridericia bracteolata* (DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 764. 2010, nom. nud. invalid. TYPE: Brazil. s. loc., s.d., *C. F. P. von Martius s.n.* (holotype, G-DC!; isotype, M-86397!).

Habitat and distribution. This species is found in wet lowland forests in Colombia (Amazonas, Nariño), Ecuador, Peru (Loreto), and Brazil (Amazonas).

4. Fridericia candicans (Rich.) L. G. Lohmann, comb. nov. Basionym: *Bignonia candicans* Rich., Actes Soc. Hist. Nat. Paris 1: 110. 1792. *Arrabidaea candicans* (Rich.) DC., in A. DC., Prodr. 9: 185. 1845. *Fridericia candicans* (Rich.) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1604. 2008, nom. nud. invalid. *Fridericia candicans* (Rich.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 764. 2010, nom. nud. invalid. TYPE: French Guiana. Cayenne, 1792, *J. B. Le Blond 290* (holotype, G-8805!, G-8805 as photo F neg. 26169 at MO-1692778!).

Habitat and distribution. This species is found widely in wet lowland to montane forest vegetation, often on white sand substrates in South America (Gentry, 1997), in Mexico (Tabasco, Veracruz), Belize, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Amazonas, Antioquia, Arauca, Atlántico, Bolívar, Caldas, Cauca, Chocó, Córdoba, Cundinamarca, Huila, La Guajira, Magdalena, Meta, Norte de Santander, Putumayo, Santander, Sucre, Tolima), Venezuela (Aragua, Barinas, Bolívar, Carabobo, Distrito Federal, Mérida, Miranda, Portuguesa, Sucre, Táchira, Trujillo, Yaracuy, Zulia), Guyana, Suriname, French Guiana, Ecuador, Peru (Loreto, San Martín, Ucayali), Bolivia, Paraguay, and Brazil (Acre, Amapá, Amazonas, Ceará, Mato Grosso, Pará).

5. Fridericia carichanensis (Kunth) L. G. Lohmann, comb. nov. Basionym: *Bignonia carichanensis* Kunth, Nov. Gen. Sp. (quarto ed.) 3: 137. 1818 [1819]. *Pentelesia discolor* Raf., Sylva Tellur. 78. 1838, nom. illeg. superfl. *Arrabidaea carichanensis* (Kunth) Bureau & K. Schum., Fl. Bras. 8(2): 62. 1896. TYPE: Venezuela. Bolívar: betw. Encaramadae & Carichana, close to River Orinoco, May, *F. W. H. A. von Humboldt & A. J. A. Bonpland 831* (holotype, P-Bonpl.!, P-Bonpl. as photo F neg. 39419 at MO-1692924!; isotype, B-W-11414!).

Nomenclatural note. The names *Bignonia carichanensis* and *B. verrucosa* Kunth were published simultaneously, with both names applying to the

same species. These taxa were previously synonymized by Gentry (1982), who chose the first name.

Habitat and distribution. This species is found in seasonally flooded lowland forest vegetation (Gentry, 1997) in Colombia (Vichada) and Venezuela (Amazonas, Anzoátegui, Apure, Bolívar, Guárico).

6. Fridericia caudigera (S. Moore) L. G. Lohmann, comb. nov. Basionym: *Bignonia caudigera* S. Moore, Trans. Linn. Soc. London, Bot. 4: 415. 1895. *Arrabidaea caudigera* (S. Moore) A. H. Gentry, Ann. Missouri Bot. Gard. 63(1): 43. 1976. *Fridericia caudigera* (S. Moore) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1604. 2008, nom. nud. invalid. *Fridericia caudigera* (S. Moore) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. Mato Grosso: Corumbá, Jan. 1891–1892, *S. Moore 971* (holotype, BM!).

Habitat and distribution. This species is found in dry forest vegetation in Bolivia, Paraguay, Brazil (Acre, Bahia, Ceará, Espírito Santo, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraná, Santa Catarina, São Paulo), and Argentina (Corrientes, Misiones).

7. Fridericia celastroides (Bureau ex K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea celastroides* Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 213. 1894. *Fridericia celastroides* (Bureau ex K. Schum.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. Bahia: near Jacobina, s.d., *J. S. Blanchet 3419* (lectotype, designated here, G-8903!; isolectotypes, P [barcode] P00468568!, P [barcode] P00468569!).

Nomenclatural note. Two syntypes were cited in the protologue of this name, *Blanchet 3419* and *Glaziou 14110*. Good material of the collection *Blanchet 3419* was found both at P (two duplicates) and G, while material of *Glaziou 14110* was found at MO (MO-2167736) and K (photocopy at MO-2904336!). No locality information was given in the protologue for the Glaziou collection, but its label gives a general collecting locality in the region of Rio de Janeiro. The *Blanchet 3419* collection is preferred due to its more accurate collection locality and the higher number of duplicates, and the specimen at G is chosen as the lectotype because it includes the largest number of flowers.

Habitat and distribution. This species is found in dry forest and cerrado vegetation in eastern Brazil (Bahia, Minas Gerais, Rio de Janeiro).

8. Fridericia chica (Bonpl.) L. G. Lohmann, comb. nov. Basionym: *Bignonia chica* Bonpl., Pl. Aequinoct. 1: 107, tab. 31, fig. 1. 1807. *Lundia chica* (Bonpl.) Seem., Bot. Voy. Herald 180. 1854. *Arrabidaea chica* (Bonpl.) Verl., Rev. Hort. 40: 154. 1868. *Fridericia chica* (Bonpl.) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1604. 2008, nom. nud. invalid. *Fridericia chica* (Bonpl.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Venezuela. Amazonas: ad amnen Cassiquiare et ad flumen Orenocum inter Esmeraldas et Maypure, s.d., *F. W. H. A. von Humboldt & A. J. A. Bonpland s.n.* (holotype, P [barcode] P00136295!; isotypes, B-W-11422!, K!).

Habitat and distribution. This species is widely and frequently found in wet to seasonal, lowland to montane forest vegetation (Gentry, 1997) in Mexico (Campeche, Chiapas, Oaxaca, Veracruz), the Antilles (Dominica, Dominican Republic, Puerto Rico, Virgin Islands), Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Amazonas, Bolívar, Chocó, Córdoba, La Guajira, Magdalena, Meta, Nariño, Putumayo, Santander, Tolima, Valle del Cauca), Venezuela (Amazonas, Apure, Aragua, Barinas, Bolívar, Carabobo, Delta Amacuro, Lara, Portuguesa, Táchira, Trujillo, Yaracuy, Zulia), French Guiana, Ecuador, Peru (Cajamarca, Cusco, Loreto, Madre de Dios, San Martín), Bolivia, Paraguay, Brazil (Acre, Amazonas, Bahia, Ceará, Distrito Federal, Espírito Santo, Goiás, Maranhão, Mato Grosso, Minas Gerais, Pará, Paraná, Pernambuco, Piauí, Rio de Janeiro, Rio Grande do Sul, Rondônia, Catarina, São Paulo), Uruguay, and Argentina (Corrientes, Misiones).

9. Fridericia cinerea (Bureau ex K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea cinerea* Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 213. 1894. *Fridericia cinerea* (Bureau ex K. Schum.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. Bahia: Jacobina, Serra do Açuruá, Rio São Francisco, 1838, *J. S. Blanchet 2856* (lectotype, designated here, P [barcode] P00468558!; isolectotypes, NY [barcode] NY00313083!, NY [barcode] NY00313083 as photocopy at MO-2927265!, P [barcode] P00468557!, W not seen, W as photo F neg. 32953 at MO-1692871!).

Nomenclatural note. Original material of the type collection of this species is at P. Two duplicates are deposited there and the best material is here selected as the lectotype.

Habitat and distribution. This species is found in dry forest vegetation in Venezuela (Bolívar), Guyana, Suriname, Bolivia, and Brazil (Bahia, Ceará, Minas Gerais, Pará).

10. Fridericia cinnamomea (DC.) L. G. Lohmann, comb. nov. Basionym: *Bignonia cinnamomea* DC., in A. DC., Prodr. 9: 164. 1845. *Arrabidaea cinnamomea* (DC.) Sandwith, Candollea 7: 248. 1936. *Fridericia cinnamomea* (DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. Mato Grosso: Cuiabá, Nov. 1832, *A. Silva Manso s.n.* (holotype, G-DC!, G-DC as photo F neg. 7632 at MO-1692888!).

Habitat and distribution. This species is found widely in evergreen lowland forest vegetation (Gentry, 1997) in Colombia (Amazonas), Venezuela (Amazonas, Bolívar), French Guiana, Peru (Loreto, Pasco San Martín, Ucayali), Bolivia, and Brazil (Amazonas, Bahia, Goiás, Maranhão, Mato Grosso, Pará, Roraima).

11. Fridericia claussenii (A. DC.) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea claussenii* A. DC., Prodr. 9: 186. 1845, as "*clausseni.*" *Petastoma claussenii* (A. DC.) Miers, Proc. Roy. Hort. Soc. London 3: 195. 1863. *Fridericia claussenii* (A. DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. Minas Gerais: s. loc., 1838, *P. Claussen 197* (lectotype, designated here, G-DC!; isolectotypes, K [barcode] K000449113!, MO-2245222!, NY [barcode] NY00-313085!, P [barcode] P00468554!, P [barcode] P00468555!, P [barcode] P00468556!).

Nomenclatural note. Three syntypes were cited in the protologue for this species, *Claussen 197*, *Claussen 422* (G-DC!), and *Claussen 507* (G!, G as photo F neg. 7665 at MO-1692780!). In addition, a Claussen specimen located at MO (MO-2245221!) seems to correspond to one of these collections but has no collection number. The collection *Claussen 197* is the most widely distributed and is here designated as the type; the specimen at G-DC is chosen as the lectotype because it was available to de Candolle.

Habitat and distribution. This species is found in dry forest vegetation in eastern Brazil (Bahia, Minas Gerais).

12. Fridericia conjugata (Vell.) L. G. Lohmann, comb. nov. Basionym: *Bignonia conjugata* Vell., Fl. Flumin. 231. 1825 [1829]; Fl. Flumin. Icon. 6: tab. 18. 1827 [1831]. *Arrabidaea conjugata* (Vell.) Mart., Flora 24(2, Beibl.): 46. 1841. *Fridericia conjugata* (Vell.) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1605. 2008, nom. nud. invalid. *Fridericia conjugata* (Vell.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: tab. 18 in Vellozo, Fl. Flumin., Icon. 6, 1827 [1831] (lectotype, designated here).

Habitat and distribution. This species is found widely in humid forest vegetation in Guatemala, Costa Rica, Panama, Colombia (Atlántico, Bolívar, Caquetá, César, Chocó, Magdalena, Santander, Sucre, Vichada), Venezuela (Falcón), French Guiana, Ecuador, Peru (Huánuco, Madre de Dios), Bolivia, Brazil (Acre, Amapá, Amazonas, Bahia, Distrito Federal, Espírito Santo, Maranhão, Minas Gerais, Pará, Paraná, Pernambuco, Rio de Janeiro, Rio Grande do Sul, Rondônia, São Paulo, Sergipe), and Argentina (Misiones).

13. Fridericia corchoroides (Cham.) L. G. Lohmann, comb. nov. Basionym: *Bignonia corchoroides* Cham., Linnaea 7: 706. 1832 [1833]. *Arrabidaea corchoroides* (Cham.) DC., in A. DC., Prodr. 9: 183. 1845. *Fridericia corchoroides* (Cham.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. s. loc., Nov., *F. Sellow 1603* (holotype, LE not seen; isotype, B†, B as photo F neg. 18448 at K! and at MO-1692782!, US-2825544 image!).

Habitat and distribution. This species is found in Atlantic forest vegetation in eastern Brazil (Bahia, Espírito Santo, Minas Gerais, Piauí, São Paulo).

14. Fridericia costaricensis (Kraenzl.) L. G. Lohmann, comb. nov. Basionym: *Saldanhaea costaricensis* Kraenzl., Repert. Spec. Nov. Regni Veg. 17(8–12): 124. 1921. *Arrabidaea costaricensis* (Kraenzl.) A. H. Gentry, Brittonia 25(3): 231. 1973. TYPE: Costa Rica. Puntarenas: Nicoya, May 1900, *A. Tonduz 13929* (holotype, B†; lectotype, designated here, G not seen, G as photo F neg. 26204 at MO-1693049!; isolectotypes, F-1012279 image!, K [barcode] K000449474 image!, MO-2229714!, MO-3401780!, US-861250 image!, US-862811 image!, US-861250 and US-862811 together as unnumbered photo at MO-1130237!).

Nomenclatural note. The best material and part of the principal set of Tonduz's materials of this

species are deposited in Geneva, and the G specimen is here selected as the lectotype.

Habitat and distribution. This species is found in dry forest vegetation in Mexico (Chiapas, Oaxaca), Honduras, Nicaragua, and Costa Rica.

15. Fridericia crassa (Bureau & K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Distictis crassa* Bureau & K. Schum., Fl. Bras. 8(2): 177. 1896. *Arrabidaea crassa* (Bureau & K. Schum.) Sprague, Hooker's Icon. Pl. 30: tab. 2933. 1911. *Distictella crassa* (Bureau & K. Schum.) Urb., Repert. Spec. Nov. Regni Veg. 14: 310. 1916. *Fridericia crassa* (Bureau & K. Schum.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. Piauí: Oeiras, 1840, *G. Gardner 2468* (lectotype, designated here, P [barcode] P00468562!, P [barcode] P00468562 as photocopy at MO-2692718!; isolectotypes, P [barcode] P00468563!, P [barcode] P00468564!, P [barcode] P00468565!, W!, W as photo F neg. 32862 at MO-1692953!).

Nomenclatural note. Original material of the type collection is at P where Bureau worked. Four duplicates are deposited there, and the specimen with the best material is here selected as the lectotype.

Habitat and distribution. This species is found in dry forest vegetation in northeastern Brazil (Maranhão).

16. Fridericia craterophora (DC.) L. G. Lohmann, comb. nov. Basionym: *Bignonia craterophora* DC., in A. DC., Prodr. 9: 147. 1845. *Arrabidaea craterophora* (DC.) Bureau, Kongel. Danske Vidensk. Selsk. Skr., Naturvidensk. Math. Afd., ser. 6, 6(3): 422. 1892. *Fridericia craterophora* (DC.) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1605. 2008, nom. nud. invalid. *Fridericia craterophora* (DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. Minas Gerais: betw. Serro Frio & Contendas, s.d., *C. F. P. von Martius 33* (holotype, M!; isotype, P [barcode] P00468566!).

Habitat and distribution. This species is found in dry forest and cerrado vegetation in eastern Bolivia, Paraguay, and Brazil (Bahia, Distrito Federal, Goiás, Maranhão, Mato Grosso, Minas Gerais, Pará, São Paulo).

17. Fridericia cuneifolia (DC.) L. G. Lohmann, comb. nov. Basionym: *Bignonia cuneifolia* DC., in A. DC., Prodr. 9: 157. 1845. *Petastoma cuneifolium* (DC.) Bureau & K. Schum., Fl. Bras. 8(2): 77. 1896. *Arrabidaea cuneifolia* (DC.) Sandwith, Kew Bull. 22: 413. 1968. *Fridericia cuneifolia* (DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. Minas Gerais: Serro Frio, *C. F. P. von Martius 337* (holotype, G-DC not seen; isotype, M-86375!, M-86375 as unnumbered photo at MO-1693016!).

Habitat and distribution. This species is found in cerrado and dry caatinga vegetation in eastern Brazil (Bahia, Minas Gerais, Piauí).

18. Fridericia dichotoma (Jacq.) L. G. Lohmann, comb. nov. Basionym: *Bignonia dichotoma* Jacq., Enum. Syst. Pl. 25. 1760, non *Arrabidaea dichotoma* Bureau, 1893. *Panterpa dichotoma* (Jacq.) Miers, Proc. Roy. Hort. Soc. London 3: 196. 1863. *Fridericia dichotoma* (Jacq.) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1605. 2008, nom. nud. invalid. *Fridericia dichotoma* (Jacq.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Colombia. Magdalena: Cartagena, not located. *Bignonia corallina* Jacq., Fragm. Bot. 37, tab. 42, fig. 1. 1809. *Arrabidaea corallina* (Jacq.) Sandwith, Bull. Misc. Inform. Kew 8(4): 460. 1953 [1954]. TYPE: Venezuela. Caracas, s.d., *N. J. Jacquin s.n.* (holotype, W not seen, W as photo F neg. 32859 at MO-1692933!).

Nomenclatural note. *Bignonia dichotoma* is the oldest name for this species (Sandwith, 1954a: 460) and the corresponding combination is made here in *Fridericia*. However, that particular name has not been used for this species recently, because this species was included in *Arrabidaea* where the name *A. dichotoma* Bureau was previously published for a different species (here called *Tanaecium selloi* (Spreng.) L. G. Lohmann). In *Arrabidaea* this species is correctly called *A. corallina* (Jacq.) Sandwith.

Gentry (1977) suggested that Jacquin's specimen at W that is labeled as being from Caracas, Venezuela, and identified as *Bignonia corallina* may also be the type material of *B. dichotoma*, but he did not explain the situation or his reasoning further. No information was given in the protologue about where *B. dichotoma* was found, though in a later work (Jacquin, 1763) the type locality of *B. dichotoma* was reported as Cartagena, Colombia, where Jacquin did collect. No original material that can be clearly connected with the name *B. dichotoma* has been traced so far nor has this species been directly connected in Jacquin's works with *B.*

corallina, so further studies are needed before the typification of this name can be resolved.

Habitat and distribution. This species is widely and commonly found in dry to humid lowland forest vegetation in Mexico (Chiapas, Colima, Guerrero, Jalisco, México, Oaxaca, Veracruz), Belize, Guatemala, Nicaragua, Costa Rica, Panama, Colombia (Amazonas, Atlántico, Bolívar, César, Chocó, Huila, La Guajira, Magdalena, Meta, Sucre, Tolima), Venezuela (Amazonas, Anzoátegui, Apure, Aragua, Barinas, Bolívar, Carabobo, Cojedes, Distrito Federal, Falcón, Guárico, Lara, Mérida, Miranda, Monagas, Nueva Esparta, Portuguesa, Sucre, Táchira, Trujillo, Yaracuy, Zulia), Guyana, Suriname, French Guiana, Ecuador, Peru (Cusco, Loreto, Madre de Dios, Piura, San Martín, Tumbes, Ucayali), Bolivia, Paraguay, Brazil (Acre, Alagoas, Amapá, Amazonas, Bahia, Ceará, Distrito Federal, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraíba, Pernambuco, Piauí, Rio de Janeiro, Rio Grande do Sul, Rondônia, Roraima, Santa Catarina, São Paulo, Tocantins), and Argentina (Chaco, Corrientes, Formosa, Jujuy, Misiones, Salta).

19. Fridericia dispar (Bureau ex K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea dispar* Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 213. 1894. *Fridericia dispar* (Bureau ex K. Schum.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. Bahia: near Japira, Dec. 1840, *J. S. Blanchet 3082* (lectotype, designated here, NY [barcode] NY00313088!, NY [barcode] NY00313088 as photocopy at MO-1692785!; isolectotypes, BR-879951!, BR-879934!, G-DC not seen, G-DC as photo F neg. 7630 at MO-1692785!, US-2515208 image!).

Nomenclatural note. No specimens were cited in the protologue of this species, where the name was attributed to Bureau. Bureau and Schumann (1896) in a contemporaneous treatment cited three specimens of *Arrabidaea dispar* from Bahia, which can be considered original material: *Blanchet 3082*, *Martius s.n.* from near Maracão, and *Glaziou 11226*, for which the collection locality is unknown. The Blanchet collection was the only one located and is here chosen as the type of this species; the specimen at NY is designated the lectotype because it is in the best condition and the only specimen that includes flowers.

Habitat and distribution. This species is found in dry forest, cerrado, and caatinga vegetation in northeastern Brazil (Bahia, Ceará, Maranhão, Pará, Paraíba, Pernambuco).

20. Fridericia egensis (Bureau & K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea egensis* Bureau & K. Schum., Fl. Bras. 8(2): 65. 1896. *Fridericia egensis* (Bureau & K. Schum.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. Amazonas: Alto Amazonas, betw. Tefé & Ega, Dec. 1821, *E. F. Poeppig 2895* (lectotype, designated here, W!, W as photo F neg. 32855 at MO-1692870!; isolectotypes, K!, W!).

Nomenclatural note. Two adequate duplicates of the type collection are deposited at W in Poeppig's original materials, and were annotated by him with this name. One of these was photographed by the Field Museum with the photos widely distributed, and this is chosen here as the lectotype.

Habitat and distribution. This species is found in wet forest vegetation in Venezuela (Amazonas), Guyana, Ecuador, Peru (Loreto), Bolivia, and Brazil (Amazonas, Maranhão, Pará).

21. Fridericia elegans (Vell.) L. G. Lohmann, comb. nov. Basionym: *Bignonia elegans* Vell., Fl. Flumin. 247. 1825 [1829]; Fl. Flumin. Icon. 6: tab. 27. 1827 [1831]. *Adenocalymma elegans* (Vell.) Mart. ex K. Schum., Nat. Pflanzenfam. 4(3b): 214. 1894. *Pseudocalymma elegans* (Vell.) Kuhlm., Rodriguésia 5(14): 365. 1941. *Arrabidaea elegans* (Vell.) A. H. Gentry, Taxon 24(4): 338. 1975. *Fridericia elegans* (Vell.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: tab. 27 in Vellozo, Fl. Flumin., Icon. 6, 1827 [1831] (lectotype, designated here).

Habitat and distribution. This species is found in Atlantic forest vegetation in southeastern Brazil (Rio de Janeiro).

22. Fridericia erubescens (DC.) L. G. Lohmann, comb. nov. Basionym: *Bignonia erubescens* DC., in A. DC., Prodr. 9: 157. 1845. *Cuspidaria erubescens* (DC.) Bureau, Vidensk. Meddel. Dansk. Naturhist. Foren. Kjøbenhavn 1893: 102. 1893 [1894]. *Piriadacus erubescens* (DC.) Pichon, Bull. Soc. Bot. France 92: 225. 1946. *Alsocydia erubescens* (DC.) J. C. Gomes, Revista Brasil. Biol. 11: 49. 1951. *Fridericia erubescens* (DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. Minas Gerais: Serro Frio, July 1818, *C. F. P. von Martius s.n.* (lectotype, designated here, M-88919!, M-88919 as photo K neg. 59450 at K!; isolectotypes, M-88918!, M-88918 as photo K

neg. 5944 at K!, M-88920!, M-88920 as photo K neg. 5947 at K!).

Nomenclatural note. The name *Cuspidaria erubescens* as first used by Bureau (1864: 5, tab. 3) was apparently not intended to describe a new species, but to transfer the name *Bignonia erubescens* to *Cuspidaria*. However, Bureau made no reference there to this basionym, and thus the name was not validly published there and only validated later in a more complete publication. No collection number was listed in the protologue of *B. erubescens* for the Martius collection that was cited. A set of unnumbered Martius collections deposited at M that match the locality described by de Candolle and whose identity corresponds to this species are here chosen as the type, and the best material deposited is here selected as the lectotype.

Habitat and distribution. This species is found in cerrado and dry caatinga vegetation in eastern Brazil (Bahia, Ceará, Espírito Santo, Minas Gerais, Pernambuco, Piauí, Rio de Janeiro).

23. Fridericia fagoides (Cham.) L. G. Lohmann, comb. nov. Basionym: *Bignonia fagoides* Cham., Linnaea 7: 680. 1832 [1833]. *Arrabidaea fagoides* (Cham.) Bureau, in J. E. B. Warming, Lagoa Santa 270. 1892. *Fridericia fagoides* (Cham.) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1605. 2008, nom. nud. invalid. *Fridericia fagoides* (Cham.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. s. loc., s.d., *F. Sellow 1602* (holotype, LE not seen; isotypes, B†, B as photo F neg. 18450 at MO-1692786!, NY [barcode] NY00579081!, NY [barcode] NY00579081 as photocopy at MO-2927267!).

Habitat and distribution. This species is found in dry forest vegetation in Bolivia, Paraguay, and Brazil (Espírito Santo, Goiás, Mato Grosso do Sul, Minas Gerais, Rio de Janeiro).

24. Fridericia fanshawei (Sandwith) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea fanshawei* Sandwith, Bull. Torrey Bot. Club 75: 662. 1948. *Fridericia fanshawei* (Sandwith) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: British Guiana [Guyana]. Mazaruni River, 24 Jan. 1944, *D. B. Fanshawe 4288* (holotype, K!; isotype, NY [barcode] NY00313090!).

Habitat and distribution. This species is found in wet forest vegetation in South America, in Colombia (Amazonas), Venezuela (Bolívar, Delta Amacuro), Guyana, French Guiana, and Suriname to Ecuador, Peru (Amazonas, Loreto, Madre de Dios, Pasco, San Martín), Bolivia, and Brazil (Amapá, Amazonas, Mato Grosso, Pará).

25. Fridericia floribunda (Kunth) L. G. Lohmann, comb. nov. Basionym: *Bignonia floribunda* Kunth, Nov. Gen. Sp. (quarto ed.) 3: 134. 1818 [1819]. *Arrabidaea floribunda* (Kunth) Loes., Repert. Spec. Nov. Regni Veg. 16: 209. 1919. TYPE: Mexico. Campeche: s. loc., s.d., *F. W. H. A. von Humboldt & A. J. A. Bonpland s.n.* (holotype, P-Bonpl.!).

Habitat and distribution. This species is found in dry lowland forest vegetation in Mexico (Campeche, Chiapas, Guerrero, Michoacán, Oaxaca, Quintana Roo, Veracruz, Yucatán), Belize, Guatemala, El Salvador, and Panama.

26. Fridericia florida (DC.) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea florida* DC., in A. DC., Prodr. 9: 184. 1845. *Fridericia florida* (DC.) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1605. 2008, nom. nud. invalid. *Fridericia florida* (DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. Amazonas: Rio Negro, Japurá, Dec. 1819, *C. F. P. von Martius s.n.* (lectotype, designated here, M-86371!; isolectotypes, G-DC!, G-DC as photo F neg. 7669 at MO-1692787!, K [barcode] K000402519!, M-86370!, M-86367!, M-86368!, M-86369!).

Nomenclatural note. No collection number was given in the protologue for the Martius collection that was cited. A set of unnumbered Martius collections that match the locality described by de Candolle and whose identity corresponds to this species are here chosen as the type, and the best quality specimen at M is selected as lectotype.

Habitat and distribution. This species is widely and commonly found in dry to humid, lowland to premontane forest vegetation in Mexico (Campeche, Chiapas, Oaxaca, Tabasco, Veracruz, Yucatán), Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Amazonas, Antioquia, Bolívar, Boyacá, Caldas, Caquetá, Chocó, Córdoba, La Guajira, Magdalena, Meta, Putumayo, Risaralda, Santander, Tolima, Vaupés), Venezuela (Amazonas, Apure, Bolívar, Carabobo, Cojedes, Distrito Federal, Mérida, Miranda, Portuguesa, Sucre, Táchira, Zulia), Guyana, Suriname, French Guiana, Ecuador, Peru (Amazonas, Cusco, Huánuco, Junín,

Loreto, Madre de Dios, Pasco, Puno, San Martín, Ucayali), Bolivia, Paraguay, Brazil (Acre, Amapá, Amazonas, Bahia, Distrito Federal, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraná, Rio de Janeiro, Rondônia, Roraima, São Paulo), and Argentina (Misiones).

27. Fridericia formosa (Bureau) L. G. Lohmann, comb. nov. Basionym: *Petastoma formosum* Bureau, Rev. Hort. 40: 154. 1868, nom. nud., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 1893: 100. 1894. *Petastoma formosa*, orth. var. *Arrabidaea formosa* (Bureau) Sandwith, Kew Bull. 22: 414. 1968. *Fridericia formosa* (Bureau) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. Minas Gerais: close to Ayuruaca near Rio Preto, 18 Apr. 1878, *A. Glaziou 9526* (lectotype, designated here, P [barcode] P00608051!; isolectotype, P [barcode] P00608052!).

Nomenclatural note. There has been confusion about the place of publication of this name. Bureau first mentioned it in the *Revue Horticole* but provided no diagnosis, thus that name was not validly published there. This name was later cited as newly published in the Flora Brasiliensis (Bureau & Schumann, 1896), but in fact it was validly described prior to that. In the actual protologue three syntypes from Brazil are listed: *Warming s.n.* from Lagoa Santa in Minas Gerais, *Glaziou 9526* from Ayuruaca in Minas Gerais, and *Glaziou 16266* from an unknown locality. (Additional specimens were cited in the Flora Brasiliensis, but these do not constitute syntypes in this case.) Of the syntypes examined, the specimens of *Glaziou 9526* deposited at P are most likely to represent original material and also have the best material and locality information; therefore, this collection is chosen as the type. There is one sheet of this collection at P with flowers and another with fruits; the flowering specimen is selected here as the lectotype because the flowers are diagnostic for this species.

Habitat and distribution. This species is found in cerrado and deciduous forest vegetation in southeastern Brazil (Distrito Federal, Minas Gerais, São Paulo).

28. Fridericia grosourdyana (Baill.) L. G. Lohmann, comb. nov. Basionym: *Paramansoa grosourdyana* Baill., Hist. Pl. 10: 27. 1888. *Arrabidaea grosourdyana* (Baill.) Sandwith, Kew Bull. 22: 418. 1968. TYPE: Venezuela. Bolívar: Villa de Upata, 1864, *R. de Grosourdy s.n.* (lectotype, designated here, P [barcode] P00468560!; isolectotype, P [barcode] P00468561!).

Nomenclatural note. No collection number was listed in the protologue for the Grosourdy collection that was cited. A set of unnumbered Grosourdy collections at P that match the locality described by Baillon and whose identity corresponds to this species are here chosen as the type, and the best quality material is selected as lectotype.

Habitat and distribution. This species is found in wet lowland to premontane forest vegetation (Gentry, 1997) in Colombia (Amazonas), Venezuela (Bolívar), Guyana, and French Guiana.

29. Fridericia japurensis (DC.) L. G. Lohmann, comb. nov. Basionym: *Tabebuia japurensis* DC., in A. DC., Prodr. 9: 214. 1845. *Macfadyena japurensis* (DC.) Miers, Proc. Roy. Hort. Soc. London 3: 200. 1863. *Arrabidaea japurensis* (DC.) Bureau & K. Schum., Fl. Bras. 8(2): 65. 1896. *Scobinaria japurensis* (DC.) Sandwith, Kew Bull. 13: 440. 1858 [1859]. *Fridericia japurensis* (DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. Amazonas: Rio Negro, Japurá, Dec. 1819, *C. F. P. von Martius 182* (holotype, G-DC!; isotype, M-86354!, M-86354 as photo F neg. 20439 at K! and at MO-1692789!).

Habitat and distribution. This species is widely found in evergreen lowland forest vegetation (Gentry, 1997) in Belize, Nicaragua, Panama, Colombia (Amazonas, Bolívar, Caquetá, Vaupés), Venezuela (Amazonas, Bolívar, Delta Amacuro), Suriname, French Guiana, Ecuador, Peru (Amazonas, Loreto, Madre de Dios, Pasco), Bolivia, and Brazil (Acre, Amapá, Amazonas, Mato Grosso, Minas Gerais, Pará, Roraima).

30. Fridericia lauta (Bureau & K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea lauta* Bureau & K. Schum., Fl. Bras. 8(2): 43. 1896. *Pyrostegia lauta* Miers, Proc. Roy Hort. Soc. 3: 188. 1863, nom. nud. *Fridericia lauta* (Bureau & K. Schum.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. Pará: Santarém, May 1850, *R. Spruce 716* (lectotype, designated here, K [barcode] K000449130!; isolectotypes, K [barcode] K000449131!, M-88926!, M-88926 as photo F neg. 20440 at MO-1692790!, W!, W as photo F neg. 32857 at MO-1692878!).

Nomenclatural note. Miers's specimens are presumably at BM (Stafleu & Cowan, 1981), but no

material of the type collection was found there or at P, where Bureau worked. Spruce's main set of collection is at K, where there are two sheets; the best of these is here chosen as the lectotype.

Habitat and distribution. This species is found in seasonal and dry vegetation in Amazonian Brazil (Acre, Amazonas, Pará, Rondônia).

31. Fridericia leucopogon (Cham.) L. G. Lohmann, comb. nov. Basionym: *Bignonia leucopogon* Cham., Linnaea 7: 707. 1832 [1833]. *Panterpa leucopogon* (Cham.) Miers, Proc. Roy. Hort. Soc. 3: 196. 1863. *Petastoma leucopogon* (Cham.) Bureau ex Warm., Symbolae 40: 1215. 1893. *Arrabidaea leucopogon* (Cham.) Sandwith, Kew Bull. 22: 414. 1968. *Fridericia leucopogon* (Cham.) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard, 107(2): 1605. 2008, nom. nud. invalid. *Fridericia leucopogon* (Cham.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. s. loc., s.d., *F. Sellow s.n.* (holotype, LE not seen; isotype, G-DC!).

Habitat and distribution. This species is found in dry to moist forest vegetation in Bolivia and Brazil (Bahia, Distrito Federal, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pernambuco, Rio de Janeiro, Santa Catarina, São Paulo).

32. Fridericia limae (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea limae* A. H. Gentry, Phytologia 46(4): 204. 1980. *Fridericia limae* (A. H. Gentry) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. Pernambuco: 6 km Espírito Santo [sic], on rd. to Araripina, 4 Jan. 1961, *A. Lima 61–3592* (holotype, INPA-13239 not seen, INPA-13239 as photocopy at MO-2698845!; isotype, MO-2630121!).

Habitat and distribution. This species is found in dry caatinga vegetation in eastern Brazil (Bahia, Ceará, Espírito Santo, Pernambuco, Piauí).

33. Fridericia mollis (Vahl) L. G. Lohmann, comb. nov. Basionym: *Bignonia mollis* Vahl, Eclog. Amer. 2: 46. 1798. *Arrabidaea mollis* (Vahl) Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 213. 1894. *Fridericia mollis* (Vahl) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: French Guiana. s. loc., s.d., *J. P. von Rohr s.n.* (holotype, C not seen, C as photo F neg. 22150 at MO-1692792!).

Habitat and distribution. This species is found in wet lowland to premontane forest vegetation (Gentry, 1997) in Venezuela (Bolívar, Delta Amacuro), Guyana, Suriname, French Guiana, and Brazil (Amapá, Amazonas, Pará, Roraima).

34. Fridericia mollissima (Kunth) L. G. Lohmann, comb. nov. Basionym: *Bignonia mollissima* Kunth, Nov. Gen. Sp. (quarto ed.) 3: 133. 1818 [1819]. *Panterpa mollissima* (Kunth) Miers, Proc. Roy. Hort. Soc. London 3: 196. 1863. *Arrabidaea mollissima* (Kunth) Bureau & K. Schum., Fl. Bras. 8(2): 46. 1896. TYPE: Venezuela. Aragua: Caracas, Valles de Aragua, Villa de Cura, Mar., *F. W. H. A. von Humboldt & A. J. A. Bonpland 740* (holotype, P-Bonpl.!, P-Bonpl. as photo F neg. 39422 at MO-1692928!; isotype, B-W-11431!).

Nomenclatural note. The names *Bignonia mollissima* Kunth and *B. littoralis* Kunth were published simultaneously; these have long been synonymized under the name *B. mollissima* (e.g., Gentry, 1973b).

Habitat and distribution. This species is found in semideciduous forest vegetation (Gentry, 1997) in Mexico (Chiapas, Guerrero, Oaxaca, Veracruz), the Greater Antilles (Jamaica), Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Antioquia, Atlántico, Bolívar, César, Chocó, Córdoba, Cundinamarca, Magdalena, Sucre), Venezuela (Anzoátegui, Apure, Aragua, Bolívar, Carabobo, Distrito Federal, Falcón, Guárico, Lara, Miranda, Portuguesa, Sucre, Zulia).

35. Fridericia monophylla (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea monophylla* A. H. Gentry, Mem. New York Bot. Gard. 29: 274. 1978. *Fridericia monophylla* (A. H. Gentry) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. Roraima: Rio Anauá, tributary of Rio Branco, 30 Apr. 1974, *J. Murça-Pires, P. B. Cavalcante, H. Magnano & N. T. Silva 14491* (holotype, IAN not seen; isotype, MO-2232884!).

Habitat and distribution. This species is found in campinas vegetation on white sand substrates in northern Brazil (Amazonas, Pará, Roraima).

36. Fridericia nicotianiflora (Kraenzl.) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea nicotianiflora* Kraenzl., Notizbl. Bot. Gart. Berlin-Dahlem 6: 369. 1915, as "*nicotianaeflora*." *Fridericia nicotianiflora* (Kraenzl.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010,

nom. nud. invalid. TYPE: Brazil. Acre: Rio Branco, Seringal São Francisco, Apr. 1911, *E. Ule 9782* (holotype, B†, B as photo F neg. 18451 at MO-1692795!; lectotype, designated here, K [barcode] K000403352!).

Nomenclatural note. The only isotype located during this study is here chosen as the lectotype, to replace the destroyed holotype.

Habitat and distribution. This species is found in seasonal vegetation in Colombia (Córdoba, Putumayo), Ecuador, Peru (Huánuco, Madre de Dios, Puno), Bolivia, and western Brazil (Acre, Rondônia).

37. Fridericia nigrescens (Sandwith) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea nigrescens* Sandwith, Lloydia 2: 209. 1939. *Fridericia nigrescens* (Sandwith) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Brazil. Amapá: close to border with Guyana, Akarai Mtns., height of land betw. drainage of River Mapuera (Trombetas tributary) & Shodikar Creek (Essequibo tributary), 600–800 m, 19 Jan. 1938, *A. C. Smith 2977* (holotype, F-1023607!; isotypes, G-8849! K!, MO-1165475!, NY [barcode] NY00313104!, P [barcode] P00468547!).

Habitat and distribution. This species is found in evergreen lowland forest vegetation (Gentry, 1997) in Colombia (Guainía), Venezuela (Amazonas, Bolívar), Guyana, Suriname, French Guiana, Peru (Madre de Dios), Bolivia, and Brazil (Acre, Amapá, Amazonas, Maranhão, Pará, Rondônia).

38. Fridericia oligantha (Bureau & K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea oligantha* Bureau & K. Schum., Fl. Bras. 8(2): 63. 1896. *Fridericia oligantha* (Bureau & K. Schum.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Brazil. s. loc., s.d., *G. Gardner 1258* (holotype, W!, W in photo F neg. 32858 at MO-1692874!).

Habitat and distribution. This species is found in humid vegetation in Colombia (Amazonas), Ecuador, Guyana, Suriname, French Guiana, and Brazil (Acre, Maranhão, Pará).

39. Fridericia ornithophila (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea ornithophila* A. H. Gentry, Ann. Missouri Bot. Gard. 64: 312, fig. 1. 1977 [1978]. *Fridericia ornithophila* (A. H. Gentry) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Brazil. Pará: Acará, Thomé Açú, Pão Vermelho, 3 Aug. 1931, *Y. Mexia 6041* (holotype, MO-1068874!; isotypes, NY [barcode] NY00346064!, US-1615868 image!).

Habitat and distribution. This species is found in wet forest vegetation in northern Bolivia and Brazil (Acre, Amapá, Amazonas, Maranhão, Mato Grosso, Pará, Rondônia).

40. Fridericia oxycarpa (Urb.) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea oxycarpa* Urb., Repert. Spec. Nov. Regni Veg. 14: 301. 1916. TYPE: Trinidad. Close to Moruga, June, *W. E. Broadway 3188* (holotype, B†).

Nomenclatural note. No duplicates of the type have been located at NY, but herbaria in Trinidad where a duplicate might be deposited have not been searched yet. Therefore the typification of this species cannot yet be clarified.

Habitat and distribution. This species is found in semideciduous forest vegetation (Gentry, 1997) in Panama, Colombia (Bolívar, Cundinamarca, Magdalena), Venezuela (Amazonas, Anzoátegui, Bolívar, Cojedes, Guárico, Lara, Miranda, Portuguesa, Sucre, Zulia), Trinidad and Tobago, and Brazil (Amazonas).

41. Fridericia paradoxa (Sandwith) L. G. Lohmann, comb. nov. Basionym: *Petastoma paradoxum* Sandwith, Kew Bull. 9: 603. 1954 [1955]. *Arrabidaea paradoxa* (Sandwith) Sandwith, Kew Bull. 22: 414. 1968. *Fridericia paradoxa* (Sandwith) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Brazil. Bahia: near Tamabury, Oct. 1906, *E. Ule 7067* (holotype, K!, K as photocopy at MO-2904335!; isotypes, B [barcode] B100186001!, B [barcode] B100186001 as photocopy at MO-2719406!, HBG not seen).

Habitat and distribution. This species is found in dry caatinga vegetation in eastern Brazil (Bahia, Piauí).

42. Fridericia parviflora (Mart. ex DC.) L. G. Lohmann, comb. nov. Basionym: *Pithecoctenium parviflorum* Mart. ex DC., in A. DC., Prodr. 9: 197. 1845. *Arrabidaea parviflora* (Mart. ex DC.) Bureau & K. Schum., Fl. Bras. 8(2): 53. 1896. *Fridericia parviflora* (Mart. ex DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Brazil. Bahia: Rio de Contas, Oct. 1818, *C. F. P. von Martius s.n.* (lectotype, designated here, M-86353!, M-86353 in photo F neg. 20441 at MO-1692849!).

Nomenclatural note. No collection number was given for the Martius collection that was cited in the protologue of this species. An unnumbered Martius collection of this species at M corresponds to the type locality and is here designated as the lectotype. Gentry noted in sched. that there is a label mix-up on two photos, F neg. 20441 and F. neg. 20442. F neg. 20441 is labeled "Arrabidaea plicifolia" but actually corresponds to the type of *Pithecoctenium parviflorum* (≡ *Fridericia parviflora*), while F neg. 20442 is labeled "Arrabidaea parviflora" but actually corresponds to the type of *Adenocalymma plicifolium* Mart. ex DC. [≡ *F. pliciflora* (Mart. ex DC.) L. G. Lohmann].

Habitat and distribution. This species is found in dry forest vegetation in southern and eastern Brazil (Bahia, Ceará, Mato Grosso do Sul, Minas Gerais, Paraíba, Pernambuco).

43. Fridericia patellifera (Schltdl.) L. G. Lohmann, comb. nov. Basionym: *Bignonia patellifera* Schltdl., Linnaea 8: 516. 1833. *Petastoma patelliferum* (Schltdl.) Miers, Proc. Roy. Hort. Soc. London 3: 195. 1863. *Arrabidaea patellifera* (Schltdl.) Sandwith, Kew Bull. 22: 413. 1968. *Fridericia patellifera* (Schltdl.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Mexico. Veracruz: prope la Hacienda de la Laguna, *C. J. W. Schiede 153* (holotype, HAL not seen; isotypes, MO-2005562!, P [barcode] P00468579!).

Habitat and distribution. This species is widely and commonly found in dry to humid, lowland to premontane forest vegetation (Gentry, 1997) in Mexico (Campeche, Chiapas, Colima, Guerrero, Jalisco, Michoacán, Nayarit, Oaxaca, Quintana Roo, Tabasco, Veracruz), Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Amazonas, Antioquia, Bolívar, Boyacá, Caquetá, César, Chocó, Magdalena, Meta, Nariño, Santander), Venezuela (Amazonas, Bolívar, Falcón, Mérida, Miranda, Táchira, Yaracuy, Zulia), Trinidad and Tobago, Guyana, Suriname, French Guiana, Ecuador, Peru (Amazonas, Cusco, Huánuco, Loreto, Madre de Dios, Pasco, Puno, San Martín, Ucayali), Bolivia, and Brazil (Acre, Amazonas, Espírito Santo, Mato Grosso, Pará, Rondônia, Roraima).

44. Fridericia pearcei (Rusby) L. G. Lohmann, comb. nov. Basionym: *Bignonia pearcei* Rusby, Mem. Torrey Bot. Club 6: 100. 1906. *Arrabidaea pearcei* (Rusby) K. Schum. ex Urb., Repert. Spec. Nov. Regni Veg. 14: 302. 1914. *Fridericia pearcei* (Rusby) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Bolivia. La Paz: Guanai-Tipuani, Apr.–June 1892, *A. M. Bang 1391* (holotype, NY-313146!; isotypes, F-163739 image!, G-9126!, G-9125!, M-86363!, MO-2005581!, US-47714 image!, US-47713 image!, US-1322423 image!).

Habitat and distribution. This species is found in wet forest vegetation in Colombia (La Guajira), Ecuador, Peru (Amazonas, Cusco, Huánuco, Junín, Loreto, Madre de Dios, Pasco, Puno, San Martín, Ucayali), and Brazil (Amazonas, Pará).

45. Fridericia platyphylla (Cham.) L. G. Lohmann, comb. nov. Basionym: *Bignonia platyphylla* Cham., Linnaea 7: 679. 1832. *Bignonia brachypoda* DC., in A. DC., Prodr. 9: 146. 1845, nom. illeg. superfl. *Arrabidaea brachypoda* Bureau, Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 1893: 98, 1894, replacement name, non *Arrabidaea platyphylla* DC., 1845. *Arrabidaea platyphylla* (Cham.) Bureau & K. Schum., Fl. Bras. 8(2): 38. 1896, hom. illeg., non *Arrabidaea platyphylla* DC., 1845. *Bignonia brachypoda* var. *platyphylla* (Cham.) DC., in A. DC., Prodr. 9: 146. 1845. *Fridericia platyphylla* (Cham.) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1606. 2008, nom. nud. invalid. *Fridericia platyphylla* (Cham.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Brazil. San Antonio do Monte, s.d., *F. Sellow s.n.* (holotype, LE not seen; isotypes, B†, B as photo F neg. 18452 at MO-1692775!, HAL-098686 image!, K [barcode] K000449124 image!, US-282538 image!).

Nomenclatural note. The name *Bignonia brachypoda* DC. was illegitimate when it was published because the previously published valid name *B. platyphylla* Cham. was included within the circumscription of the species as a synonym, but that name should have been used for this species instead. De Candolle did not designate a type for his species, and named several varieties but did not indicate which of them was the typical variety. Therefore his name *B. brachypoda* is a superfluous name that is typified by the type of the name that should correctly have been adopted, *B. platyphylla* (McNeill et al., 2006, Art. 52.2). Later Bureau intended to transfer the illegitimate name *B. brachypoda* into *Arrabidaea* because he thought it was the correct name for this species, but Bureau's name is not a legitimate combination because his intended basionym is illegitimate. However, Bureau's name does represent a legitimate, valid replacement name for the name *B. brachypoda*, which was needed because the name *A. platyphylla*

was previously published for a different species and thus cannot be used for this species. Shortly after Bureau's replacement name was published, Bureau and Schumann (1896) noticed that the name *B. platyphylla* was the older name for this species and accordingly transferred that name into *Arrabidaea*; however, their intended new combination here is illegitimate because, as noted, the name *A. platyphylla* had previously been published for another species.

Habitat and distribution. This species is found in seasonal and cerrado vegetation in Venezuela (Amazonas, Bolívar, Carabobo, Cojedes, Delta Amacuro, Guárico, Portuguesa), Peru (Cusco, Huánuco, Junín, Loreto, Madre de Dios, Pasco, Puno, San Martín, Ucayali), Bolivia, Paraguay, and Brazil (Acre, Amazonas, Bahia, Ceará, Distrito Federal, Espírito Santo, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraná, Piauí, Rio de Janeiro, Rondônia, Roraima, São Paulo, Tocantins).

46. Fridericia pliciflora (Mart. ex DC) L. G. Lohmann, comb. nov. Basionym: *Adenocalymma pliciflorum* Mart. ex DC., in A. DC., Prodr. 9: 202. 1845. *Arrabidaea pliciflora* (Mart. ex DC.) Bureau & K. Schum., Fl. Bras. 8(2): 51. 1896. *Fridericia pliciflora* (Mart. ex DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Brazil. Piauí: s. loc., Mar. 1818, *C. F. P. von Martius 1874* (holotype, M-86392!, M-86392 as photo F neg. 20442 at MO-1692846!; isotype, G-DC!).

Nomenclatural note. Gentry noted in sched. that there is a label mix-up on two photos, F neg. 20441 and F. neg. 20442: F neg. 20441 is labeled "Arrabidaea plicifolia" but actually corresponds to the type of *Pithecoctenium parviflorum* (≡ *Fridericia parviflora*), while F neg. 20442 is labeled "Arrabidaea parviflora" but actually corresponds to the type of *Adenocalymma plicifolium* (≡ *F. pliciflora*).

Habitat and distribution. This species is found in dry caatinga vegetation in eastern Brazil (Ceará, Maranhão, Piauí).

47. Fridericia podopogon (DC.) L. G. Lohmann, comb. nov. Basionym: *Spathodea podopogon* DC., in A. DC., Prodr. 9: 205. 1845. *Macfadyena podopogon* (DC.) Griseb., Cat. Pl. Cub. 195. 1866. *Neomacfadya podopogon* (DC.) Baill. ex K. Schum., Nat. Pflanzenfam. 4(3b): 227. 1984 (as "*Neomacfadyena*"). *Arrabidaea podopogon* (DC.) A. H. Gentry, Rhodora 79: 439. 1977. TYPE: Cuba. Havana, 1829, *R. de la Sagra 293* (holotype, G-DC!, G-DC in photo F neg. 33894 at MO-1693063!).

Habitat and distribution. This species is found in dry forest vegetation in Mexico (Campeche, Oaxaca, Quintana Roo, Yucatán), the Greater Antilles (Cuba), Belize, and Guatemala.

48. Fridericia poeppigii (DC.) L. G. Lohmann, comb. nov. Basionym: *Anemopaegma poeppigii* DC., in A. DC., Prodr. 9: 190. 1845. *Petastoma poeppigii* (DC.) Sandwith, Candollea 7: 249. 1937. *Arrabidaea poeppigii* (DC.) Sandwith, Kew Bull. 22: 414. 1968. *Fridericia poeppigii* (DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Peru. s. loc., 1832, *E. F. Poeppig 75* (holotype, G-DC!, G-DC in photo F neg. 7661 at MO-1692746!).

Habitat and distribution. This species is found in dry seasonal and cerrado vegetation in Peru (Cusco, Madre de Dios), Bolivia, and Brazil (Distrito Federal, Goiás, Minas Gerais, São Paulo).

49. Fridericia prancei (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea prancei* A. H. Gentry, Ann. Missouri Bot. Gard. 63(1): 50, fig. 1A. 1976. *Fridericia prancei* (A. H. Gentry) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Brazil. Amazonas: Km. 67 E of Manaus–Itacoatiara Rd., 24 Nov. 1974, *A. H. Gentry 12822* (holotype, INPA!; isotypes, MO-2251712!, RB-185813 [barcode] 53870!, RB-185813 [barcode] 538142!, RB-185813 [barcode] 538143!).

Habitat and distribution. This species is found in evergreen lowland forest vegetation (Gentry, 1997) in Colombia (Amazonas), Venezuela (Amazonas), Peru (Puno), and Brazil (Acre, Amazonas, Pará, Rondônia).

50. Fridericia pubescens (L.) L. G. Lohmann, comb. nov. Basionym: *Bignonia pubescens* L., Sp. Pl. (ed. 2) 2: 870. 1763. *Petastoma pubescens* (L.) Miers, Proc. Roy. Hort. Soc. London 3: 195. 1863. *Arrabidaea pubescens* (L.) A. H. Gentry, Brittonia 25(3): 239. 1973. *Fridericia pubescens* (L.) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1606. 2008, nom. nud. invalid. *Fridericia pubescens* (L.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Mexico. Campeche, s.d., *W. Houston s.n.* (holotype, LINN-776.3 fiche!; isotype, BM!).

Habitat and distribution. This species is widely and commonly found in dry to humid forest vegetation in Mexico (Campeche, Chiapas, Colima, Oaxaca, Querétaro, Quintana Roo, San Luis Potosí, Tabasco, Tamaulipas, Veracruz, Yucatán), Belize, Guatemala, Panama, Colombia (Atlántico, Bolívar, César, Cundinamarca, Huila, Magdalena, Meta, Sucre, Vichada), Venezuela (Amazonas, Anzoáteguí, Aragua, Barinas, Bolívar, Carabobo, Distrito Federal, Falcón, Guárico, Lara, Miranda, Monagas, Portuguesa, Sucre, Táchira, Zulia), Trinidad and Tobago, Guyana, Suriname, Ecuador, Peru (Loreto, Madre de Dios, San Martín, Tumbes, Ucayali), Bolivia, Paraguay, and Brazil (Acre, Bahia, Ceará, Distrito Federal, Espírito Santo, Goiás, Minas Gerais, Pará, Paraíba, Pernambuco, Rio de Janeiro, Roraima, São Paulo, Sergipe).

51. Fridericia rego (Vell.) L. G. Lohmann, comb. nov. Basionym: *Bignonia rego* Vell., Fl. Flumin. 249. 1825 [1829], as "*rego*"; Fl. Flumin. Icon. 6: tab. 39. 1827 (1831), as "*sego*." *Arrabidaea rego* (Vell.) DC., Biblioth. Univers. Geneve, sér. 2. 17: 126. 1838. *Vasconcellia rego* (Vell.) Mart., Flora 24(2, Beibl.): 12. 1841, as "*sego*." *Chasmia rego* (Vell.) Kuntze, Revis. Gen. Pl. 2: 479. 1891. *Fridericia rego* (Vell.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: tab. 39 in Vellozo, Fl. Flumin. Icon. 6, 1827 [1831] (lectotype, designated here).

Habitat and distribution. This species is found in humid to dry forest vegetation in eastern Brazil (Bahia, Ceará, Espírito Santo, Minas Gerais, Paraíba, Rio de Janeiro, São Paulo).

52. Fridericia samydoides (Cham.) L. G. Lohmann, comb. nov. Basionym: *Bignonia samydoides* Cham., Linnaea 7: 669. 1832 [1833]. *Petastoma samydoides* (Cham.) Miers, Proc. Roy. Hort. Soc. London 3: 195. 1863. *Arrabidaea samydoides* (Cham.) Sandwith, Kew Bull. 22: 413. 1968. *Fridericia samydoides* (Cham.) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1606. 2008, nom. nud. invalid. *Fridericia samydoides* (Cham.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Brazil. São Paulo: s. loc., s.d., *F. Sellow s.n.* (holotype, LE not seen; isotypes, B†, B in photo F neg. 18490 at MO-1692906!, G-DC!, NY-111536!, P [barcode] P00468580!, P [barcode] P00468581!).

Nomenclatural note. The B specimen cited here is labeled as collected by Sellow, without a collection number. Another specimen of this species at B is labeled as *Sellow 5243* and was also photographed as a possible type of this name (F neg. 18489 at MO-1692905!), but seems to be a different collection.

Habitat and distribution. This species is found in cerrado vegetation in Paraguay, southeastern Brazil (Espírito Santo, Minas Gerais, Paraná, Santa Catarina, São Paulo), and northern Argentina (Misiones).

53. Fridericia schumanniana (Loes.) L. G. Lohmann, comb. nov. Basionym: *Paragonia schumanniana* Loes., Bot. Jahrb. Syst. 23: 130. 1896, non *Arrabidaea schumanniana* Huber, 1906. TYPE: Nicaragua. Matagalpa: near Cañada Yasica, ca. 800 m, Aug., *E. Rothschuh 230* (holotype, B†).

Adenocalymma verrucosum Standl., Publ. Field Columbian Mus., Bot. Ser. 4: 323. 1929. *Martinella verrucosa* (Standl.) Standl., Contr. Arnold Arbor. 5: 138. 1933. *Scobinaria verrucosa* (Standl.) Seibert, Publ. Carnegie Inst. Wash. 522: 408. 1940. *Arrabidaea verrucosa* (Standl.) A. H. Gentry, Selbyana 2(1): 43, fig. 12d. 1977. *Fridericia verrucosa* (Standl.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Honduras. Atlántida: near Tela, Dec. 1927–Mar. 1928, *P. C. Standley 54891* (holotype, F-584059 image!; isotypes, A not seen, G-8924!, US-1408512 image!).

Nomenclatural note. *Paragonia schumanniana* is the oldest name that applies to this species, but has not been used for it recently because this species has been classified in *Arrabidaea*, where the name *A. schumanniana* Huber was already published for a different species (here called *Bignonia binata* Thunb.) and thus could not be used for this species. The next oldest name for this species is *Adenocalymma verrucosum*, thus in *Arrabidaea* this species was called *Arrabidaea verrucosum*. In *Fridericia* the oldest name can again be used, and the corresponding combination is made here. Type material has not been located for *P. schumanniana*, and further work is needed before the typification of this species can be resolved.

Habitat and distribution. This species is found in humid forest vegetation in Mexico (Chiapas, Oaxaca, Tabasco, Veracruz), Belize, Guatemala, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Amazonas, Antioquia, Chocó, La Guajira, Meta, Nariño), and Venezuela (Apure, Táchira, Zulia), Ecuador, Peru (Amazonas, Cusco, Huánuco, Junín, Loreto, Madre de Dios, Pasco, Puno), Bolivia, and Brazil (Acre, Amazonas).

54. Fridericia simplex (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea simplex* A. H. Gentry, Phytologia 46: 206. 1980.

Fridericia simplex (A. H. Gentry) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Brazil. Goiás [Tocantins]: Parque Nacional do Tocantins, entre a Sede e Veadeiros, 26 Sep. 1967, *J. H. de Haas, Sr., J. H. de Haas & R. B. Belém 344* (holotype, HB not seen; isotype, MO-2698253!).

Habitat and distribution. This species is found in cerrado vegetation in central Brazil (Goiás, Maranhão, Tocantins).

55. Fridericia speciosa Mart., Nova Acta Phys.-Med. Acad. Caes. Leop.-Carol. Nat. Cur. 13: 9, tab. A, 1827. TYPE: Brazil. Rio de Janeiro, *C. F. P. von Martius 358* (*Mart. Herb. Fl. Bras. 448*) (lectotype, designated here, M-86416!; isolectotypes, G-DC!, M-86417!, M-86417 as photo K neg. 4189 at SPF-92651!, MO-1998898!, NY [barcode] NY00328847!, NY [barcode] NY00328848!).

Nomenclatural note. The name *Fridericia guillielma* Mart. was published at the same time as *F. speciosa*; these names were synonymized by Schumann (1894: 222) who chose the name *F. speciosa*. Original material of the type collection is at M. Two duplicates are deposited there, and the best material is here selected as the lectotype.

Habitat and distribution. This species is found in humid to dry forest vegetation in eastern and southeastern Brazil (Bahia, Espírito Santo, Mato Grosso, Minas Gerais, Paraná, Rio de Janeiro, São Paulo).

56. Fridericia spicata (Bureau & K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea spicata* Bureau & K. Schum., Fl. Bras. 8(2): 42. 1896. *Fridericia spicata* (Bureau & K. Schum.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Peru. San Martín: Tarapoto, 1855–1856, *R. Spruce 4535* (holotype, P [barcode] P00468548!; isotypes, BR-876447!, NY [barcode] NY00313120!).

Habitat and distribution. This species is found in wet forest vegetation in Colombia (Amazonas), French Guiana, Ecuador, Peru (Loreto, Madre de Dios, Ucayali), Bolivia, and Brazil (Amapá, Amazonas, Pará).

57. Fridericia subexserta (Bureau & K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea subexserta* Bureau & K. Schum. Fl. Bras. 8(2): 59. 1896 [1897]. TYPE: Brazil. Near the city of Rio de Janeiro, Mar. 1882, *A. Glaziou 12996* (lectotype, designated here, P [barcode] P00608047!; isolectotypes, F-998521 image!, P [barcode] P00608048!, P [barcode] P00608049!).

Nomenclatural note. Original material of this type collection is at P. Three duplicates are deposited there, and the best material is here selected as the lectotype.

Habitat and distribution. This species is found in dry forest vegetation in Bolivia and southern Brazil (Rio de Janeiro).

58. Fridericia subincana (Mart.) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea subincana* Mart., Flora 24(2, Beibl.) 47. 1841. *Fridericia subincana* (Mart.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Brazil. Rio de Janeiro, 1839, *Herb. Mart. Fl. Bras. 514* (holotype, M-86358!; isotypes, G-DC!, G-DC as photo F neg. 7668 at MO-1692860!, G-9263!, MO-2005569!, NY [barcode] NY00313121!).

Habitat and distribution. This species is found in wet sites in Atlantic forest vegetation in eastern Brazil (Bahia, Espírito Santo, Rio de Janeiro, São Paulo).

59. Fridericia subverticillata (Bureau & K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea subverticillata* Bureau & K. Schum., Fl. Bras. 8(2): 24. 1896. *Fridericia subverticillata* (Bureau & K. Schum.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Brazil. Rio de Janeiro: Teresópolis to São Luiz, Rio Jaú, 18 Jan. 1876, *A. Glaziou 11230* (holotype, P [barcode] P00468549!; isotype, C not seen, C as photo F neg. 22153 at MO-1692861!).

Habitat and distribution. This species is found in dry caatinga vegetation in eastern Brazil (Ceará, Piauí, Rio de Janeiro).

60. Fridericia trachyphylla (Bureau & K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Petastoma trachyphyllum* Bureau & K. Schum., Fl. Bras. 8(2): 77. 1896. *Arrabidaea trachyphylla* (Bureau & K. Schum.) Sandwith, Kew Bull. 22: 413. 1968. *Fridericia trachyphylla* (Bureau & K. Schum.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Brazil. Goiás: Cattus Altas Infiçionado, s.d., *J. E. Pohl 3472* (holotype, W!, W as photo F. neg. 32872 at MO-1693023!).

Habitat and distribution. This species is found in Atlantic forest vegetation in eastern Brazil (Espírito Santo, Goiás, Minas Gerais, Rio de Janeiro).

61. Fridericia trailii (Sprague) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea trailii* Sprague, Bull. Herb. Boissier, sér. 2, 6: 372. 1906. *Fridericia trailii* (Sprague) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Brazil. Amazonas: Lower Amazonas, Óbidos, June 1874, *J. W. H. Trail 638* (holotype, K!).

Habitat and distribution. This species is found in humid lowland forest vegetation (Gentry, 1997) in Venezuela (Bolívar), Guyana, Suriname, French Guiana, Peru (Madre de Dios), Bolivia, and Brazil (Acre, Amapá, Amazonas, Pará, Rondônia, Roraima).

62. Fridericia triplinervia (Mart. ex DC.) L. G. Lohmann, comb. nov. Basionym: *Bignonia triplinervia* Mart. ex DC., in A. DC., Prodr. 9: 153. 1845. *Petastoma triplinerve* (Mart. ex DC.) Miers, Proc. Roy. Hort. Soc. London 3: 195. 1863. *Arrabidaea triplinervia* (Mart. ex DC.) Baill. ex Bureau, Vidensk. Meddel. Dansk Foren. Kjøbenhavn 1893: 99. 1894. *Saritaea triplinervia* (Mart. ex DC.) Dugand, Caldasia 3: 266. 1945. *Fridericia triplinervia* (Mart. ex DC.) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1606. 2008, nom. nud. invalid. *Fridericia triplinervia* (Mart. ex DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Brazil. São Paulo: betw. Paranangaba & Mineiros, Dec. 1817, *C. F. P. von Martius s.n.* (holotype, M-86356!, M-86356 in photo F neg. 20445 at MO-1692863!; isotypes, G-DC!, K!, M-86357!).

Habitat and distribution. This species is found in humid to dry forest vegetation in central Bolivia, Paraguay, Brazil (Amazonas, Bahia, Ceará, Distrito Federal, Espírito Santo, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraíba, Paraná, Pernambuco, Rio de Janeiro, Rondônia, São Paulo), and Argentina (Misiones).

63. Fridericia truncata (Sprague) L. G. Lohmann, comb. nov. Basionym: *Mansoa truncata* Sprague, Bull. Herb. Boissier, sér. 2, 5: 83. 1905. *Petastoma truncatum* (Sprague) Hassl., Repert. Spec. Nov. Regni Veg. 9: 53. 1910. *Arrabidaea truncata* (Sprague) Sandwith, Kew Bull. 22: 414. 1968. *Fridericia truncata* (Sprague) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1606. 2008, nom. nud. invalid. TYPE: Paraguay. Concepción, Sep. 1901–1902, *E. Hassler 7482* (holotype, K [barcode] K000403426!; isotypes, MO-1573931!, NY [barcode] NY00328881!, NY [barcode] NY00328896!, NY [barcode] NY00328897!, P [barcode] P00481576!, P [barcode] P00481577!).

Habitat and distribution. This species is found in dry forest and Chaco vegetation in Bolivia, Paraguay, and Argentina (Chaco, Jujuy, Salta, Tucumán).

64. Fridericia tuberculata (DC.) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea tuberculata* DC., in A. DC., Prodr. 9: 184. 1845. *Fridericia tuberculata* (DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Brazil. Pará: s. loc., s.d., *C. F. P. von Martius s.n.* (holotype, G-DC!).

Nomenclatural note. The older name *Bignonia pilulifera* Rich. (Actes Soc. Hist. Nat. Paris 1: 111, 1792) may apply to this species. However, the type of *B. pilulifera* (French Guiana, Cayenne, s.d., *J. B. Le Blond s.n.*, presumably at P) has not yet been located and this situation needs further study.

Habitat and distribution. This species is widely and frequently found in humid forest vegetation in Colombia (Antioquia, Bolívar), Venezuela (Amazonas, Apure, Bolívar), Guyana, Suriname, French Guiana, Ecuador, Peru (Cusco, Huánuco, Loreto, Madre de Dios, Pasco, San Martín), Bolivia, and Brazil (Amapá, Amazonas, Goiás, Maranhão, Mato Grosso, Pará, Rondônia, Roraima).

65. Fridericia tynanthoides (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea tynanthoides* A. H. Gentry, Phytologia 46: 208. 1980. *Fridericia tynanthoides* (A. H. Gentry) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 766. 2010, nom. nud. invalid. TYPE: Brazil. Minas Gerais: Pedra Azul, Pedra da Conceição, 20 Apr. 1964, *Z. A. Trinta 762 & E. Fromm 1835* (holotype, HB not seen; isotypes, MO-2692665!, M!, NY [barcode] NY00313124!).

Habitat and distribution. This species is found in Atlantic forest vegetation in eastern Brazil (Espírito Santo, Minas Gerais).

66. Fridericia viscida (Donn. Sm.) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea chica* var. *viscida* Donn. Sm., Bot. Gaz. 20: 7. 1895. *Arrabidaea viscida* (Donn. Sm.) A. H. Gentry, Wrightia 7(2): 84. 1982. TYPE: Guatemala. Santa Rosa: Casillas, 4000 ft., May 1893, *E. T. Heyde 4550* (syntypes, MICH not seen, MO-2005591!, MO- 3168684!, US-1322450 image!, US-1322451 image!).

Nomenclatural note. Two specimens of the type collection from Donnell Smith's herbarium are deposited in US, and further study is needed to clarify the typification of this name.

Habitat and distribution. This species is found in dry forest vegetation in Mexico (Chiapas, Colima, Guerrero, Jalisco, México, Morelos), Belize, Guatemala, Honduras, and Nicaragua.

67. Fridericia whitei (Rusby) L. G. Lohmann, comb. nov. Basionym: *Anemopaegma whitei* Rusby, Mem. New York Bot. Gard. 7: 353. 1927. *Petastoma whitei* (Rusby) Sandwith, Kew Bull. 8(4): 462. 1953 [1954]. *Arrabidaea whitei* (Rusby) Sandwith, Kew Bull. 22: 414. 1968. *Fridericia whitei* (Rusby) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1607. 2008, nom. nud. invalid. TYPE: Bolivia. Beni: Huachi, head of Beni River, 1800 ft., 24 Aug. 1921, *O. E. White 955* (holotype, NY [barcode] NY00313078!; isotype, MICH not seen, MICH as photocopy at MO-2699743!).

Habitat and distribution. This species is found in dry forest vegetation in Bolivia and Paraguay.

IX. Lundia DC., Biblioth. Universelle Genève, sér. 2. 17: 127. 1838, nom. cons., vs. *Lundia* Schumach. (Salicaceae). TYPE: *Lundia glabra* DC., typ. cons. [= *Lundia longa* (Vell.) DC.].

Craterotecoma Mart. ex Meisn., Pl. Vasc. Gen. 1: 300. 1840. TYPE: *Craterotecoma parviflora* DC. [= *Lundia erionema* DC.].

Exsertanthera Pichon, Bull. Soc. Bot. France 92: 226. 1946. TYPE: *Exsertanthera longa* (Vell.) Pichon [≡ *Lundia longa* (Vell.) DC.].

Lianas, without dimorphic juvenile growth, without strong odor; stems with 4 phloem wedges in cross-section, pith solid; branchlets cylindrical, puberulous to pubescent, densely lenticellate, with interpetiolar glands, with discontinuous interpetiolar ridge, with epidermis not peeling; prophylls of axillary buds triangular and minute, without glands. Leaves 2- or 3-foliolate, terminal leaflet often replaced by a simple or trifid tendril, tendrils without adhesive disks, without uncinate apices; leaflets chartaceous or coriaceous, with glands sparsely distributed over lamina, without pellucid punctations, with domatia, petiolules not articulated; petiole cylindrical, never modified into a tendril, not articulated. Inflorescence terminal and/or axillary, a simple or compound thyrse. Flowers zygomorphic, pentamerous; calyx cupular or tubular, truncate (5-apiculate in *Lundia heliocalyx*) or calyptrate (i.e., splitting transversally) and then becoming truncate through loss of top portion, membranaceous (coriaceous), puberulous to villose externally, without glands; corolla white (magenta, red), with or without nectar guides, tubular or infundibuliform, straight in tube, membranaceous to coriaceous, villose externally, without glands, lobes 5, imbricate; stamens 4, with well-developed filaments, included (exserted in *L. longa*), anthers densely villose, thecae straight, pollen in monads, colpate, with exine reticulate; ovary sessile, smooth and villose externally, ovules in 2 series on each placenta, stigma rhombic, villose; disk absent. Capsules linear, flattened, straight, coriaceous, with valves 2, puberulous, without lenticels, without glands, without wings, smooth except with midrib developed into a prominent ridge, with calyx caducous; seeds winged, with body smooth and glabrous, wings hyaline, linear.

Number of species, distribution, and habitat. *Lundia* includes 13 species found in wet to dry forest from southern Mexico to southern Brazil.

Lundia is easily recognized by its densely pubescent anthers, ovary, and stigma (synapomorphies of the genus) and its lack of a nectar disk (also a synapomorphy). Additionally the calyx is cupular or tubular in form, with its apex open or calyptrate (i.e., splitting transversally) and eventually having a characteristic essentially truncate form. Also characteristic is the fruit form, with the midrib developed into a prominent ridge; however, this feature can be difficult to observe, because *Lundia* species seem to produce very few fruits under natural conditions (Amaral, 1992; Lopes et al., 2002). Most species of *Lundia* have a bee-pollination floral syndrome (Alcantara & Lohmann, 2010), although a nectar disk is lacking so there may not be a reward for the pollinators; these may be attracted by mimicry and deception (Gentry, 1973a; Vogel, 1993). However *L. longa*, the only hummingbird-pollinated species in the genus, does have a ring of secretory trichomes in the flower that do produce nectar (Lopes et al., 2002). A species-level phylogeny hypothesis of *Lundia* has been published (Kaehler et al., 2012), and a detailed taxonomic revision is expected soon (Kaehler & Lohmann, in prep.). That revision will resolve several long-standing taxonomic problems in *Lundia*, and the species concepts and taxonomy adopted here follow that work. However, the reader should check that revision for updates and details.

1. Lundia corymbifera (Vahl) Sandwith, Receuil Trav. Bot. Néerl. 34: 229. 1937. *Bignonia corymbifera* Vahl, Eclog. Amer. 2: 45, tab. 17. 1798. *Petastoma corymbiferum* (Vahl) Miers,

Proc. Roy. Hort. Soc. London 3: 193. 1863. *Arrabidaea corymbifera* (Vahl) Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 213. 1894. *Cuspidaria corymbifera* (Vahl) Baill. ex K. Schum., Nat. Pflanzenfam. 4(3b): 216. 1894. TYPE: Trinidad. s. loc., s.d., *J. P. von Rohr 6* (holotype, C image!, C as photo F neg. 22118 at MO-1692886!).

Bignonia cordata Vell., Fl. Flumin. 247. 1825 [1829]; Fl. Flumin. Icon. 6: tab. 29. 1827 [1831]. *Lundia cordata* (Vell.) DC., in A. DC., Prodr. 9: 180. 1845. TYPE: tab. 29 in Vellozo, Fl. Flumin. Icon. 6, 1827 [1831] (lectotype, designated here).

Nomenclatural note. The name *Bignonia corymbifera* Vahl is unfortunately the basionym of two combinations published simultaneously in two different genera by Schumann (1894), as clarified by Bureau and Schumann (1896: 37, 157) who noted that the name *Cuspidaria corymbifera* was applied to plants of a different species from *B. corymbifera*. However, their citation and use of the name *C. corymbifera* there satisfy the requirements for valid publication, including being accepted at the time by the authors of the work, in spite of the identity problem they noted and did not resolve. The name *B. cordata* Vell. was applied by Bureau and Schumann (1896) to a different species from *L. corymbifera*, based on a misidentification of Vellozo's original material, but Vellozo's illustration clearly shows the same plants as *L. corymbifera*, and this name is treated as a synonym here. The other species that Bureau and Schumann equated with *B. cordata* is here treated as *L. longa*.

Habitat and distribution. This species is found widely in seasonal forest vegetation (Gentry, 1997) in Costa Rica, Panama, Colombia (Antioquia, Bolívar, César, Chocó, Córdoba, Cundinamarca, Magdalena, Sucre, Tolima, Valle del Cauca), Venezuela (Amazonas, Aragua, Bolívar, Carabobo, Distrito Federal, Falcón, Lara, Miranda, Monagas, Sucre, Trujillo, Yaracuy, Zulia), Trinidad and Tobago, Guyana, French Guiana, Ecuador, Peru (Amazonas, Cajamarca, Cusco, Loreto, Madre de Dios, San Martín, Ucayali), Bolivia, and Brazil (Espírito Santo, Minas Gerais, Rio de Janeiro, Roraima, São Paulo).

2. Lundia damazioi C. DC., Bull. Herb. Boiss., sér 2, 5: 230, fig. 1. 1905, as "*damazii*." TYPE: Brazil. Minas Gerais: Ouro Preto, s.d., *L. B. Damazio 269* (holotype, G not seen, G in photo F neg. 26193 at MO-1692990!; isotypes, F-783905 image!, RB-76446!).

Nomenclatural note. The name *Lundia neolonga* L. G. Lohmann (Cat. Pl. Fung. Brasil 1: 769. 2010, nom. nud. invalid.) has been applied to this species but never formally published and is not needed for it. The original spelling of the species epithet is correctable (McNeill et al., 2006, Art. 60.7).

Habitat and distribution. This species is found in Atlantic forest and cerrado vegetation in southeastern Brazil (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo).

3. Lundia densiflora DC., in A. DC., Prodr. 9: 181. 1845. TYPE: Brazil. Pará: betw. Sepa & Óbidos, Mar. 1820, *C. F. P. von Martius 3240* (lectotype, designated here, M-86455!, M-86455 in photo F neg. 20469 at MO-169299!; isolectotypes, G-DC!, M-86450!, M-86451!, M-86452!, M-86453!, M-86454!).

Nomenclatural note. Original material of the type collection is at M. Six duplicates are deposited there, and the best material is here selected as the lectotype.

Habitat and distribution. This species is found widely in evergreen lowland to montane forest vegetation (Gentry, 1997) and riparian forests in Colombia (Amazonas, Antioquia, Caquetá, Córdoba, Meta, Santander, Vichada), Venezuela (Amazonas, Bolívar), Guyana, Suriname, Ecuador, Peru (Huánuco, Junín, Loreto, Madre de Dios), Bolivia, and Brazil (Acre, Amapá, Amazonas, Mato Grosso, Pará, Rondônia, Roraima).

4. Lundia erionema DC., in A. DC., Prodr. 9: 181. 1845. TYPE: Brazil. Pará: Rio Amazonas, Oct.–Nov., *s. coll. s.n.* (holotype, P!; isotype, G-DC!).

Habitat and distribution. This species is found widely in humid forest vegetation in Colombia (Vaupés), Venezuela (Amazonas, Bolívar), Guyana, Suriname, French Guiana, Ecuador, Peru (Loreto, San Martín), Bolivia, and Brazil (Acre, Pará, Rondônia, Roraima).

5. Lundia gardneri Sandwith, Kew Bull. 9: 601. 1954 [1955]. TYPE: Brazil. Piauí: banks of River Parahim (N of Paranaguá & S of Gurgueia), Sep. 1839, *G. Gardner 2678* (holotype, K!; isotypes, BM!, OXF not seen).

Habitat and distribution. This species is found in cerrado and dry caatinga vegetation in eastern Brazil (Bahia, Minas Gerais, Piauí).

6. Lundia helicocalyx A. H. Gentry, Phytologia 46(4): 210. 1980. TYPE: Brazil. Piauí: Buriti dos Lopes, Canto do Morro, 90–100 m, 20 June 1972, *D. Sucre & J. Silva 9211* (holotype, RB-162875!; isotypes, MO-2630166!, SPF-193218!).

Habitat and distribution. This species is found in cerrado vegetation in northeastern Brazil (Maranhão, Piauí).

7. Lundia laevis Kaehler, Brittonia 63(4): 461, fig. 1. 2011. TYPE: Brazil. Acre: Acrelândia, basin of Rio Madeira, Rio Abunã, Porto Dias, Km. 130 of BR 364, then 30 km on Ramal do Pelé, Colocação Barrinha 3, 9°59′34.4″S, 66°47′53.5″W, 15 May 2009, *D. C. Daly, E. C. Oliveira, A. Sanchez & H. M. Oliveira 13679* (holotype, RB-491535!; isotype, NY not seen).

Taxonomic note. This species was included within the circumscription of *Lundia corymbifera* by Lohmann (2006, 2008b), and sometimes by Gentry in sched. Further field observations will be needed to fully understand the status of these plants.

Habitat and distribution. This species is found in wet, disturbed, lowland vegetation in Brazilian Amazonia (Acre, Pará, Rondônia; Kaehler, 2011).

8. Lundia longa (Vell.) DC., in A. DC., Prodr. 9: 180. 1845. *Bignonia longa* Vell., Fl. Flumin. 249. 1825 [1829]; Fl. Flumin. Icon. 6: tab. 37. 1827 [1831]. *Exsertanthera longa* (Vell.) Pichon, Bull. Soc. Bot. France 92: 226. 1946. TYPE: tab. 37 in Vellozo, Fl. Flumin. Icon. 6, 1827 [1831] (lectotype, designated here).

Nomenclatural note. The name *Bignonia longa* Vell. was synonymized with the name *Lundia cordata* by Bureau and Schumann (1896: 244), who chose the name *L. cordata*; however, these names actually apply to different species, as discussed in more detail under *L. corymbifera*.

Habitat and distribution. This species is found in wet sites in Atlantic forest vegetation in eastern Brazil (Bahia, Ceará, Espírito Santo, Paraíba, Pernambuco, Rio de Janeiro, Rio Grande do Norte, São Paulo).

9. Lundia nitidula DC., in A. DC., Prodr. 9: 181. 1845. *Lundia virginalis* var. *nitidula* (DC.) A. H. Gentry, Ann. Missouri Bot. Gard. 64(2): 315. 1977 [1978]. TYPE: Brazil. Sebastianopolis et Minarum General, s.d., *C. F. P. von Martius s.n.* (holotype, M-86444!).

Nomenclatural note. The names *Lundia nitidula* DC. and *L. virginalis* were published simultaneously. These were synonymized by Bureau (1894), who chose *L. nitidula* as the accepted name. Later Gentry (1977) synonymized *L. virginalis* and *L. nitidula* using the name *L. virginalis*, apparently without realizing that Bureau had previously selected the other name. Several morphological differences separate *L. nitidula* and *L. virginalis* (Kaeheler & Lohmann, in prep.) and these are also quite distantly related based on molecular phylogenetic data (Kaeheler et al., 2012).

Habitat and distribution. This species is found in wet sites in Atlantic forest vegetation in eastern Brazil (Bahia, Ceará, Espírito Santo, Minas Gerais, Rio de Janeiro, Santa Catarina, São Paulo).

10. Lundia obliqua Sond., Linnaea 22: 561. 1849. TYPE: Brazil. Minas Gerais: near city of Caldas near Capivary, *A. F. Regnell II-192* (lectotype, designated here, BR-876446!).

Nomenclatural note. The specimen *Pohl 6015* has sometimes been regarded in sched. as the type of this name, probably based on Bureau and Schumann's citation of it as the "specimina optima" of this species (1896: 241). However, only one collection was cited by Sonder in the protologue of this name, labeled 195 in Regnell's second series of collections from Brazil. One specimen of this species from Regnell's second series was found at BR and is here designated as the lectotype.

Habitat and distribution. This species is found in Atlantic forest vegetation in southeastern Brazil (Minas Gerais, Rio de Janeiro, São Paulo).

11. Lundia puberula Pittier, Contr. U. S. Natl. Herb. 18(6): 258. 1917. TYPE: Panama. Darién: La Palma, southern Darién, 26 Jan. 1912, *H. Pittier 5499* (holotype, US-715745 image!, US-715745 as photo MO neg. 5499 at MO-1183704!; isotypes, F-599461 image!, K!, MO-1167117!).

Habitat and distribution. This species is found widely in humid forest vegetation in Mexico (Quintana Roo, Veracruz), Belize, Guatemala, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Amazonas, Antioquia, Boyacá, Chocó, Magdalena, Meta, Norte de Santander, Santander, Valle del Cauca, Vaupés), Venezuela (Bolívar, Mérida, Miranda, Táchira, Trujillo, Zulia), Ecuador, Peru (Cusco, Junín, Loreto, Madre de Dios, Pasco, San Martín, Ucayali), Bolivia, and Brazil (Acre, Amazonas, Maranhão, Mato Grosso, Pará, Rondônia).

12. Lundia spruceana Bureau, Adansonia 8: 279. 1868. TYPE: Peru. San Martín: Tarapoto, Jan. 1856, *R. Spruce 4489* (holotype, BR-876413!; isotypes, K [barcode] K000202044!, P [barcode] P00481550!, W not seen, W as photo F neg. 32868 at MO-1692993!).

Habitat and distribution. This species is found in humid forest in Ecuador, Peru (Amazonas, Huánuco, Junín, Loreto, Madre de Dios, San Martín), Bolivia, and western Brazil (Acre).

13. Lundia virginalis DC., Prodr. 9: 181. 1845. *Lundia nitidula* var. *virginalis* (DC.) Bureau, Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 1893: 108. 1894. TYPE: Brazil. Minas Gerais: betw. Tamburil & Valo, s.d., *Wied-Neuwied s.n.* (lectotype, designated here, BR-876246!; isolectotypes, BR-876314!, BR-876347!).

Habitat and distribution. This species is found in cerrado vegetation in eastern Brazil (Bahia, Minas Gerais, Rio de Janeiro).

X. Manaosella J. C. Gomes, Arch. Jard. Bot. Rio de Janeiro 9: 83. 1949. TYPE: *Manaosella platydactyla* (Barb. Rodr.) J. C. Gomes [= *Manaosella cordifolia* (DC.) A. H. Gentry].

Lianas, without dimorphic juvenile growth, without strong odor; stems with 4 phloem wedges in cross-section, pith solid; branchlets cylindrical, puberulous, without lenticels, without interpetiolar glands, with discontinuous interpetiolar ridge, with epidermis not peeling; prophylls of axillary buds minute or absent, without glands. Leaves 2- or 3-foliolate, terminal leaflet often replaced by a multifid tendril, with adhesive disks, without uncinate apices; leaflets chartaceous, with glands sparsely distributed over lamina, without pellucid punctations, without domatia, petiolules not articulated; petiole cylindrical, never modified into a tendril, not articulated. Inflorescence axillary and/or terminal, a raceme. Flowers zygomorphic, pentamerous; calyx spathaceous, membranaceous, puberulent externally, without glands; corolla yellow to magenta, without nectar guides, tubular, straight in tube, membranaceous, glabrous externally, without glands, lobes 5, imbricate; stamens 4, with well-developed filaments, included, anthers glabrous, thecae straight, pollen in monads, colpate, with exine psilate; ovary sessile, smooth and lepidote externally, ovules in 2 series on each placenta, stigma rhombic, glabrous; disk annular. Capsules linear, flattened, straight, coriaceous, with valves 2, glabrous or puberulous, without lenticels, without glands, without wings, smooth, with calyx persistent; seeds winged, with body smooth and glabrous, wings hyaline, linear. Figure 16E, F.

Number of species, distribution, and habitat. Manaosella includes one species found in wet to dry forest vegetation from Venezuela to Bolivia and southeastern Brazil.

Manaosella is monotypic and easily recognized by its multifid tendrils that have adhesive disks on the tips; the combination of these two features is a synapomorphy of the genus. Its yellow flowers, cordate leaflets, racemose inflorescences, relatively large (more than 3 cm long) spathaceous calyx, and linear fruits are each found elsewhere in the tribe, but together aid the identification of *Manaosella*. The phylogenetic hypothesis of the tribe Bignonieae indicates that this is a distinct lineage that has not diversified (Lohmann, 2006).

1. Manaosella cordifolia (DC.) A. H. Gentry, Ann. Missouri Bot. Gard. 65(2): 733. 1978 [1979]. *Bignonia cordifolia* DC., in A. DC., Prodr. 9: 162. 1845. *Stizophyllum cordifolium* (DC.) Miers, Proc. Roy. Hort. Soc. London 3: 198. 1863. TYPE: Brazil. Bahia: Serra do Gado Bravo, near Vila Nova da Rainha, Mar., s.d., *C. F. P. von Martius s.n.* (holotype, M-86464!, M-86464 as photo F neg. 20488 at MO-1632885!).

Habitat and distribution. This species is widely found in wet to dry forest vegetation in Venezuela (Amazonas), Bolivia, and Brazil (Amazonas, Bahia, Minas Gerais, Pará, Rio de Janeiro).

XI. Mansoa DC., Biblioth. Universelle Genève, sér. 2, 17: 128. 1838. TYPE: *Mansoa hirsuta* DC. (lectotype, designated by Urban [1916: 745]).

Danielia Corr. Méllo ex Verl., Rev. Hort. 1868: 154. 1868. TYPE: *Danielia splendens* Corr. Méllo ex Verl. [= *Mansoa difficilis* (Cham.) Bureau & K. Schum.].

Hanburyophyton Bureau ex Warm., Vidensk. Medel. Dansk Naturhist. Foren. Kjøbenhavn 1893: 111. 1894. TYPE: *Hanburyophyton xanthinum* Bureau ex Warm., nom. superfl. illeg. [≡ *Mansoa lanceolata* (DC.) A. H. Gentry].

Chodanthus Hassl., Bull. Herb. Boissier, sér. 2, 6: 141. 1906. TYPE: *Chodanthus splendens* (Bureau & K. Schum.) Hassl. [= *Mansoa difficilis* (Cham.) Bureau & K. Schum.].

Pseudocalymma A. Samp. & Kuhlm., Arch. Jard. Bot. Rio de Janeiro 4(11): 15. 1933 [1934], as "*Pseudocalymna.*" TYPE: *Pseudocalymma laevigatum* (Bureau & K. Schum.) A. Samp. & Kuhlm. (lectotype, designated by Sampaio & Kuhlmann [1933 (1934): 15]) [= *Mansoa hymenaea* (DC.) A. H. Gentry].

Onohualcoa Lundell, Contr. Univ. Michigan Herb. 7: 52. 1942. TYPE: *Onohualcoa seleri* (Loes.) Lundell [= *Mansoa verrucifera* (Schltdl.) A. H. Gentry].

Bayonia Dugand, Caldasia 4: 62. 1946. TYPE: *Bayonia helicocalyx* (Kuntze) Dugand [= *Mansoa verrucifera* (Schltdl.) A. H. Gentry].

Lianas, without (with, *Mansoa parvifolia*) dimorphic juvenile growth, with garlic odor; stems with phloem wedges in multiples of 4 in cross-section, with solid

pith; branchlets cylindrical with older stems becoming angled and ribbed, glabrous to pubescent, with or without sparsely distributed lenticels, without (with) interpetiolar glands, with (without) discontinuous interpetiolar ridge, with epidermis not peeling; prophylls of axillary buds triangular and minute or bromeliad-like, without glands. Leaves 2- or 3-foliolate, terminal leaflet often replaced by a trifid tendril, tendrils without adhesive disks (with in *M. parvifolia*), without uncinate apices; leaflets chartaceous, with glands grouped in axils of veins, without pellucid punctations, without domatia, petiolules not articulated; petiole cylindrical, never modified into a tendril, not articulated. Inflorescence axillary, a thyrse (fascicle in *M. parvifolia*). Flowers zygomorphic, pentamerous; calyx cupular, shortly 5-lobed or 5-apiculate, coriaceous or membranaceous, puberulous externally, without glands or with few glands near margins; corolla magenta or pink, without nectar guides, infundibuliform, straight in tube, membranaceous, puberulous externally, without glands, lobes 5, imbricate; stamens 4, with well-developed filaments, included, anthers glabrous, thecae straight, pollen in monads, colpate, with exine areolate; ovary sessile, smooth and glabrous externally, ovules in 2 series on each placenta, stigma rhombic, glabrous; disk annular. Capsules linear, flattened or inflated, straight, woody, with valves 2, glabrous or villose, without lenticels, without glands, without wings, smooth except with midrib frequently developed into a prominent ridge, with calyx caducous; seeds winged, with body smooth and glabrous, wings opaque or hyaline, linear. Figure 16A, B.

Number of species, distribution, and habitat. *Mansoa* includes 12 species found in wet to dry forest vegetation from Mexico and the Antilles to Argentina and Brazil.

Mansoa as circumscribed here is characterized by stems that become angular and ribbed with age and have phloem wedges in multiples of 4, branchlets with prominent though discontinuous interpetiolar ridges, prophylls of the axillary buds that are minute and triangular or bromeliad-like, a garlic smell in the foliage (a synapomorphy of the genus), leaflets with subtriplinerved venation and glands in the axils of the basalmost veins, magenta corollas, 2 series of ovules on each placenta, and fruits with the midrib usually developed into a conspicuous ridge.

Gentry (1979, 1997) included *Pachyptera*, *Hanburyophyton*, and *Onhualcoa* within his circumscription of *Mansoa*, based on several morphological characters that overlap between these genera. The phylogenetic hypothesis of the tribe Bignonieae (Lohmann, 2006) found most of the species traditionally included in *Pachyptera* nested within *Mansoa* except not the type of this genus, *P. kerere* (Aubl.) A. H. Gentry, which was found to be only distantly related to these other species. Consequently, while the circumscription of *Mansoa* adopted here is similar to that of Gentry (1979, 1997), three species are here excluded: *M. erythraea* (Dugand) A. H. Gentry, *M. kerere*, and *M. ventricosa* A. H. Gentry, which are here included in a newly circumscribed *Pachyptera*.

1. **Mansoa alliacea** (Lam.) A. H. Gentry, Ann. Missouri Bot. Gard. 66(4): 782. 1979 [1980]. *Bignonia alliacea* Lam., Encycl. 1: 421. 1785. *Adenocalymma alliaceum* (Lam.) Miers, Ann. Mag. Nat. Hist., ser. 3, 7: 394. 1861. *Pseudocalymma alliaceum* (Lam.) Sandwith, Recueil Trav. Bot. Néerl. 34: 210. 1937. *Pachyptera alliacea* (Lam.) A. H. Gentry, Brittonia 25(2): 236. 1973. TYPE: French Guiana. s. loc., s.d., *J. B. C. F. Aublet s.n.* (holotype, P-LA not seen; isotype, LINN-HS1048-8 fiche!).

Habitat and distribution. This species is found in wet forest vegetation in the Lesser Antilles (Dominica, Martinique, St. Vincent), Costa Rica, Nicaragua, Panama, Trinidad and Tobago, Guyana, Suriname, French Guiana, Ecuador, Peru (Amazonas, Cajamarca, Huánuco, Loreto, Pasco, San Martín), Bolivia, and Brazil (Amazonas, Maranhão, Pará), and is occasionally cultivated.

2. **Mansoa angustidens** (DC.) Bureau & K. Schum., Fl. Bras. 8(2): 200. 1896. *Cuspidaria angustidens* DC., in A. DC., Prodr. 9: 179. 1845. TYPE: Brazil. Pará: Xingú, Aug., *C. F. P. von Martius s.n.* (holotype, M-86461!, M-86461 as photo F 20465 at MO-1692998!).

Habitat and distribution. This species is found in humid forest vegetation in Brazil (Amazonas, Bahia, Ceará, Minas Gerais, Maranhão, Pará, Pernambuco, Piauí, Rio Grande do Norte).

3. **Mansoa difficilis** (Cham.) Bureau & K. Schum., Fl. Bras. 8(2): 201. 1896. *Bignonia difficilis* Cham., Linnaea 7: 714. 1832 [1833]. *Cydista difficilis* (Cham.) Miers, Proc. Roy. Hort. Soc. London 3: 192. 1863. TYPE: Brazil. s. loc., 1840, *F. Sellow 6012* (holotype, LE not seen; isotypes, B†, B as photo F neg. 18483 at MO-1692889!, BR-876312!, K!, NY [barcode] NY00483551!).

Habitat and distribution. This species is found frequently in humid forest vegetation in Bolivia, Paraguay, Brazil (Amazonas, Bahia, Ceará, Espírito

Santo, Maranhão, Mato Grosso do Sul, Minas Gerais, Pará, Paraná, Pernambuco, Piauí, Rio de Janeiro, Rio Grande do Sul, Santa Catarina, São Paulo), and Argentina (Corrientes, Misiones), and is sometimes cultivated.

4. Mansoa glaziovii Bureau & K. Schum., Fl. Bras. 8(2): 203, tab. 90. 1896. TYPE: Brazil. Minas Gerais: Serra de Ouro Preto, s.d., *A. Glaziou 12991* (lectotype, designated here, P barcode] P00481509!; isolectotypes, F-998955 image!, K!, P [barcode] P00481510!, P as unnumbered sheets in photocopy at MO-2692715!, US-2515579 image!).

Nomenclatural note. Two syntypes were cited in the protologue of this name, *Glaziou 12991* and *Glaziou 14120*. The more widely distributed collection is here designated as the type, and the best specimen at P is selected as the lectotype.

Habitat and distribution. This species is found in wet forest vegetation in southeastern Brazil (Bahia, Minas Gerais, Rio de Janeiro).

5. Mansoa hirsuta DC., in A. DC., Prodr. 9: 182. 1845. TYPE: Brazil. Bahia: Rio São Francisco, 1838, *J. S. Blanchet 2913* (holotype, G-DC!, G-DC as photo F neg. 7670 at MO-1692996!; isotypes, BM!, K!, P [barcode] P00481513!, P [barcode] P00481514!, P [barcode] P00481515!).

Habitat and distribution. This species is found in dry forest and caatinga vegetation in eastern Brazil (Bahia, Ceará, Mato Grosso, Pernambuco, Piauí).

6. Mansoa hymenaea (DC.) A. H. Gentry, Ann. Missouri Bot. Gard. 66(4): 782. 1979 [1980]. *Bignonia hymenaea* DC., in A. DC., Prodr. 9: 158. 1945. *Pseudocalymma hymenaeum* (DC.) Sandwith, Candollea 7: 247. 1937. *Pachyptera hymenaea* (DC.) A. H. Gentry, Brittonia 25(3): 236. 1973. *Cuspidaria hymenaea* (DC.) M. R. Almeida, Fl. Maharashtra 3B: 447. 2001. TYPE: Brazil. Bahia: s. loc., 1834, *J. S. Blanchet 1434* (holotype, G-DC!, G-DC as photo F neg. 7635 at MO-1692893!; isotypes, G-8954!, P [barcode] P00481497!, P [barcode] P00481497 as photocopy at MO-2692714!, P [barcode] P00481498!).

Habitat and distribution. This species is found widely in wet to dry forest vegetation in Mexico (Campeche, Chiapas, Guerrero, Jalisco, Michoacán, Morelos, Nayarit, Oaxaca, Puebla, San Luis Potosí, Sinaloa, Tamaulipas, Veracruz, Yucatán), the Antilles (Grenada, Puerto Rico, St. Lucia), Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Venezuela (Distrito Federal, Falcón, Portuguesa), Suriname, French Guiana, Ecuador, Peru (Lambayeque, Madre de Dios, Piura, Puno, Tumbes), and Brazil (Bahia, Espírito Santo, Pará, Rio de Janeiro), and is occasionally cultivated.

7. Mansoa lanceolata (DC.) A. H. Gentry, Ann. Missouri Bot. Gard. 66(4): 780. 1979. *Tabebuia lanceolata* DC., Biblioth. Universelle Genève, sér. 2, 17: 131. 1838. *Pleonotoma lanceolata* (DC.) Miers, Proc. Roy. Hort. Soc. London 3: 184. 1863. *Hanburyophyton xanthinum* Bureau, in Warm., Vidensk. Medel. Dansk Naturhist. Foren. Kjøbenhavn 1893: 111. 1894, nom. superfl. illeg. *Anemopaegma lanceolatum* (DC.) Bureau ex K. Schum., Nat. Pflanzenfam. 4(3b): 215. 1894. TYPE: Brazil. Rio de Janeiro: Santa Tereza, 1834, *P. W. Lund & M. Guillemin 170* (holotype, G-DC!, G-DC as photo F neg. 7689 at MO-1693067!; isotypes, P [barcode] P00481573!, P [barcode] P00481574!, P [barcode] P00481575!).

Habitat and distribution. This species is found in wet sites in Atlantic forest vegetation in eastern Brazil (Bahia, Espírito Santo, Rio de Janeiro).

8. Mansoa montecillensis (Ant. Molina) C. Nelson, Fontqueria 48: 28. 1997. *Chodanthus montecillensis* Ant. Molina, Ceiba 18: 105. 1974. TYPE: Honduras. Comayagua: montaña El Cedral, Cordillera Montecillos, 20 km al S de Siguatepeque, alt. 1500 m, 6 Apr. 1957, *A. Molina R. 8011* (holotype, F not seen; isotype, EAP not seen).

Taxonomic note. This species is recognized here provisionally until its identity can be confirmed.

Habitat and distribution. This species is known from humid forest in Honduras.

9. Mansoa onohualcoides A. H. Gentry, Ann. Missouri Bot. Gard. 63(1): 63. 1976. TYPE: Brazil. Ceará: Serra de Baturité, near Sertão do Canindé, 24 Aug. 1908, *A. Ducke s.n.* (holotype, MG-1594!, MG-1594 as photocopy at MO-2436459!; isotype, K!).

Habitat and distribution. This species is found in Atlantic forest vegetation in eastern Brazil (Ceará, Espírito Santo, Maranhão); Gentry (1997) suggested it might also be found in evergreen forest in Venezuela (Amazonas), but this species is circumscribed more narrowly here and that range is excluded.

10. Mansoa parvifolia (A. H. Gentry) A. H. Gentry, Ann. Missouri Bot. Gard. 66(4): 783. 1979 [1980]. *Pachyptera parvifolia* A. H. Gentry,

Phytologia 26: 447. 1973. TYPE: Colombia. Santander: vic. Puerto Berrio, betw. Rivers Magdalena & Carare, ca. 200 m, 22 Apr. 1937, *O. Haught 2179* (holotype, MO-1188593!; isotype, US-1742407 image!).

Habitat and distribution. This species is found in wet forest vegetation in Guatemala, Honduras, Costa Rica, Panama, Colombia (Antioquia, Chocó, Santander), Ecuador, Peru (Amazonas, Junín, Loreto, Madre de Dios, Ucayali), Bolivia, and Brazil (Acre, Amazonas).

11. Mansoa standleyi (Steyerm.) A. H. Gentry, Ann. Missouri Bot. Gard. 66(4): 783. 1979. *Pseudocalymma standleyi* Steyerm., Publ. Field Mus. Nat. Hist., Bot. Ser. 23(5): 235. 1947. *Pachyptera standleyi* (Steyerm.) A. H. Gentry, Brittonia 25(3): 236. 1973. TYPE: Guatemala. Quetzaltenango: betw. Finca Pirinéos & Finca Soledad, lower S-facing slopes of Volcán Santa María, betw. Santa María de Jesús & Calahuaché, 1300–1400 m, 5 Jan. 1940, *J. A. Steyermark 33533* (holotype, F-1054546 image!; isotypes, F-1054531 image!, F-1054343 image!, US-1894642 image!).

Habitat and distribution. This species is found in forest vegetation (Gentry, 1997) in Guatemala, El Salvador, Nicaragua, Costa Rica, Panama, Colombia (Amazonas, Meta, Vichada), Venezuela (Bolívar, Delta Amacuro, Lara, Yaracuy), Guyana, Suriname, French Guiana, Ecuador, Peru (Amazonas, Huánuco, Junín, Loreto, Madre de Dios, Pasco, San Martín, Ucayali), Bolivia, and Brazil (Amazonas, Pará).

12. Mansoa verrucifera (Schltdl.) A. H. Gentry, Ann. Missouri Bot. Gard. 63(1): 62. 1976. *Bignonia verrucifera* Schltdl., Linnaea 26: 655. 1853. *Adenocalymma verruciferum* (Schltdl.) Miers, Ann. Mag. Nat. Hist., ser. 3, 7: 393. 1861. *Onohualcoa verrucifera* (Schltdl.) A. H. Gentry, Ann. Missouri Bot. Gard. 60(3): 885, fig. 22. 1973 [1974]. TYPE: Venezuela. Aragua: ad Curuciti, ca. 1500 ft., Jan., *H. Wagener 307* (holotype, HAL not seen).

Habitat and distribution. This species is found in semideciduous forest vegetation (Gentry, 1997) in Mexico (Campeche, Chiapas, Guerrero, Oaxaca, Quintana Roo, Tabasco, Veracruz, Yucatán), Belize, Guatemala, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Atlántico, Bolívar, Caquetá, César, Chocó, Cundinamarca, Magdalena, Santander, Sucre, Tolima), Venezuela (Amazonas, Anzoátegui, Aragua, Barinas, Bolívar, Carabobo, Delta Amacuro, Distrito Federal, Falcón, Guárico, Lara, Miranda, Monagas, Portuguesa, Sucre, Zulia), Trinidad and Tobago, Guyana, Ecuador, Peru (Loreto, Madre de Dios, San Martín), Bolivia, and Brazil (Acre, Amazonas, Mato Grosso, Rondônia), and is sometimes cultivated.

XII. Martinella Baill., Hist. Pl. 10: 30. 1888. TYPE: *Martinella martinii* (DC.) Baill. ex K. Schum. [= *Martinella obovata* (Kunth) Bureau & K. Schum.].

Lianas, without dimorphic juvenile growth, without strong odor; stems with 4 phloem wedges in cross-section, pith solid; branchlets cylindrical or tetragonal, glabrous or puberulous, without lenticels, without interpetiolar glands, with a ring-shaped continuous interpetiolar ridge, with epidermis not peeling; prophylls of axillary buds triangular and minute, without glands. Leaves 2- or 3-foliolate, terminal leaflet often replaced by a trifid tendril, tendrils without adhesive disks, without uncinate apices; leaflets chartaceous, with glands sparsely distributed over lamina, without pellucid punctations, without domatia, petiolules not articulated; petiole cylindrical, never modified into a tendril, not articulated. Inflorescence axillary, a thyrse. Flowers zygomorphic, pentamerous; calyx tubular, irregularly 3- or 4-lobed, membranaceous, puberulent externally, with scattered patelliform glands; corolla magenta, pink, or wine-red, without nectar guides, infundibuliform, straight in tube, membranaceous, glabrous externally, without glands, lobes 5, imbricate; stamens 4, with well-developed filaments, included, anthers glabrous, thecae straight, pollen in monads, colpate, with exine reticulate; ovary sessile, smooth and lepidote externally, ovules in 1 series on each placenta, stigma rhombic, glabrous; disk annular. Capsules linear, flattened, straight, coriaceous, with valves 2, glabrous, without lenticels, with elongated glands, without wings, smooth, with calyx caducous; seeds winged, with body smooth and glabrous, wings opaque, linear.

Number of species, distribution, and habitat. *Martinella* includes two species found in humid forest vegetation from Mexico to Bolivia and Brazil.

Martinella can be readily recognized by the combination of its trifid tendrils, minute triangular prophylls on the axillary buds, a unique interpetiolar ridge that is continuous or ring-shaped and surrounds the stem (a synapomorphy of the genus), and a characteristic bilobed or 3- to 4-parted calyx (a synapomorphy of the genus). Also unusual are the stellate trichomes and the flowers with pink to magenta or wine-colored infundibuliform corollas

that are pollinated by hummingbirds (Gentry, 1990). In the phylogenetic hypothesis of the tribe Bignonieae (Lohmann, 2006), *Martinella* appears as a distinct lineage that has diversified relatively little.

1. **Martinella iquitoensis** A. Samp., Ann. Acad. Bras. Sci. 7: 122. 1935. *Martinella equitoensis*, orth. var. TYPE: Peru. Loreto: Iquitos, 23 Feb. 1924, *J. G. Kuhlmann 1492* (holotype, RB-22027 [barcode] 5368990!; isotypes, MO-2192060!, RB-22027 [barcode] 537289!).

Habitat and distribution. This species is found in humid vegetation, usually on white sand substrates (Gentry, 1997), in Colombia (Amazonas), Venezuela (Amazonas), Ecuador, Peru (Loreto, Madre de Dios), and Brazil (Amapá, Amazonas, Pará, Rondônia).

2. **Martinella obovata** (Kunth) Bureau & K. Schum., Fl. Bras. 8(2): 161, tab. 84. 1896. *Spathodea obovata* Kunth, Nov. Gen. Sp. (quarto ed.) 3: 147. 1818 [1819]. *Bignonia obovata* (Kunth) Spreng., Syst. Veg. 2: 830. 1825. *Macfadyena obovata* (Kunth) Miers, Proc. Roy. Hort. Soc. London 3: 200. 1863. TYPE: Colombia. Magdalena: Turbaco, s.d., *F. W. H. A. von Humboldt & A. J. A. Bonpland 1391* (holotype, P-Bonpl.!).

Habitat and distribution. This species is found in humid forest vegetation, sometimes on white sand substrates (Gentry, 1997), in Mexico (Tabasco, Veracruz), Belize, Guatemala, Honduras, Costa Rica, Panama, Colombia (Amazonas, Antioquia, Atlántico, Bolívar, Boyacá, Caquetá, Chocó, Córdoba, Cundinamarca, Guianía, Guaviare, Magdalena, Nariño, Putumayo, Santander, Sucre, Valle del Cauca, Vaupes, Vichada), Venezuela (Amazonas, Anzoátegui, Bolívar, Delta Amacuro, Mérida, Miranda), Trinidad and Tobago, Guyana, Suriname, French Guiana, Ecuador, Peru (Amazonas, Huánuco, Loreto, Madre de Dios, Pasco, San Martín, Ucayali), Bolivia, and Brazil (Acre, Amapá, Amazonas, Mato Grosso, Pará, Rondônia), and is sometimes cultivated.

XIII. Neojobertia Baill., Hist. Pl. 10: 35. 1888. TYPE: *Neojobertia brasiliensis* Baill. [= *Neojobertia candolleana* (Mart. ex DC.) Bureau & K. Schum.]

Gardnerodoxa Sandwith, Kew Bull. 9: 611. 1954 [1955], syn. nov. TYPE: *Gardnerodoxa mirabilis* Sandwith [≡ *Neojobertia mirabilis* (Sandwith) L. G. Lohmann].

Lianas, without dimorphic juvenile growth, without strong odor; stems with 4 phloem wedges in cross-section, pith solid; branchlets hexagonal, glabrous to glandular-pubescent, without lenticels, without interpetiolar glands, with discontinuous interpetiolar ridge, with epidermis not peeling; prophylls of axillary buds subulate, without glands. Leaves biternately compound or biternately pinnate, terminal division often replaced by a trifid or multifid tendril, tendrils without adhesive disks, without uncinate apices; leaflets chartaceous or coriaceous, without glands, without pellucid punctations, without domatia, petiolules not articulated; petiole cylindrical, never modified into a tendril, not articulated. Inflorescence terminal and/or axillary, racemose at base and thyrsoid at apex. Flowers zygomorphic, pentamerous; calyx spathaceous and splitting or tubular and shortly 5-lobed, membranaceous, glabrous to pubescent externally, without glands; corolla yellow or red, without nectar guides, tubular or infundibuliform, straight in tube, membranaceous, glabrous or glandular-pubescent externally, without glands, lobes 5, imbricate; stamens 4, with well-developed filaments, included or exserted, anthers glabrous, thecae straight, pollen in monads, colpate, with exine areolate; ovary sessile, smooth and glabrous or glandular-pubescent externally, ovules in 1 series on each placenta, stigma rhombic, glabrous; disk annular. Capsules linear, flattened, curved, coriaceous, with valves 2, glabrous to glandular-pubescent, without lenticels, without glands, without wings, smooth, with calyx caducous; seeds winged, with body rough and glabrous, wings hyaline or opaque, linear. Figure 16C, D.

Number of species, distribution, and habitat. *Neojobertia* includes two species found in dry forest, caatinga, and savanna vegetation in central to eastern Brazil.

Neojobertia can be recognized by its hexagonal stems with four phloem wedges in cross-section, axillary buds with subulate prophylls, biternately compound or biternately pinnate leaves with a terminal multifid tendril (Fig. 16C), relatively large (more than 3 cm long) spathaceous or tubular calyx (Fig. 16C), yellow or red corollas, uniseriate ovules on the placenta, colpate pollen with areolate or reticulate exine, fruits that are markedly curved and gradually tapered to the apex (a synapomorphy of the genus), unusually long (more than 7 cm) seeds (Fig. 16D), and rough seed surface (Fig. 4B; also a synapomorphy of the genus). The only other members of the tribe Bignonieae with a calyx more than 3 cm long are *Perianthomega*, *Manaosella*, *Callichlamys*, and some species of *Dolichandra*. These other genera can be recognized by the white flowers of *Perianthomega* and the ovule arrangement in the others, biseriate in *Manaosella* and pluriseriate in *Callichlamys* and *Dolichandra* (Table 4).

Sandwith (1954b) in his description of *Gardnerodoxa* considered it different from any other known Bignonieae genus. He did suggest it was related to *Piriadacus erubescens*, which is also hummingbird pollinated and shares the associated floral adaptations with *Gardnerodoxa*; however, these taxa were found to be only distantly related in the phylogenetic hypothesis of Bignonieae (Lohmann, 2006). On the other hand, this phylogenetic hypothesis found *Gardnerodoxa* and *Neojobertia* to be sister taxa, together comprising a single, well-separated clade with a relatively low species diversity. This clade is here recognized as a single genus, based on the taxonomic criteria outlined previously.

1. Neojobertia candolleana (Mart. ex DC.) Bureau & K. Schum., Fl. Bras. 8(2): 396, tab. 109. 1896 [1897]. *Spathodea candolleana* Mart. ex DC., in A. DC., Prodr. 9: 207. 1845. *Memora candolleana* (Mart. ex DC.) Miers, Proc. Roy. Hort. Soc. London 3: 185. 1863. TYPE: Brazil. Piauí: Oeiras, near Terra Nova, Bom Jardim, Mai. 1819, *Herb. Martius Fl. Bras. 2418* (holotype, G-DC!, G-DC as photo F neg. 7692 at MO-1693059!; isotypes, M-86466!, M-86467!, M-86468!, M-86469!).

Habitat and distribution. This species is found in dry caatinga vegetation in eastern Brazil (Bahia, Ceará, Espírito Santo, Pernambuco, Piauí).

2. Neojobertia mirabilis (Sandwith) L. G. Lohmann, comb. nov. Basionym: *Gardnerodoxa mirabilis* Sandwith, Kew Bull. 9(4): 611. 1954 [1955]. *Neojobertia mirabilis* (Sandwith) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 770. 2010, nom. nud. invalid. TYPE: Brazil. Piauí: near Alagadões, ca. 100 mi. SW of Oeiras, July 1839, *G. Gardner 2677* (holotype, K!; isotypes, BM!, P [barcode] P00481462!).

Habitat and distribution. This species is found in dry caatinga vegetation in eastern Brazil (Espírito Santo, Maranhão, Piauí).

XIV. Pachyptera DC. ex Meisn., Pl. Vasc. Gen 1: 299. 1840. TYPE: *Pachyptera foveolata* DC. (lectotype, designated by Sandwith [1932: 84]) [= *Pachyptera kerere* (Aubl.) Sandwith].

Sererea Raf., Sylva Tellur. 107. 1838. TYPE: *Sererea heterophylla* Raf., nom. illeg. superfl. [≡ *Pachyptera kerere* (Aubl.) Sandwith].

Leucocalantha Barb. Rodr., Vellosia, ed. 2. 1: 46. 1891, syn. nov. *Leucocalanthe*, orth. var. TYPE: *Leucocalantha aromatica* Barb. Rodr. [≡ *Pachyptera aromatica* (Barb. Rodr.) L. G. Lohmann].

Lianas, without dimorphic juvenile growth, without strong odor; stems with 4 phloem wedges in cross-section, pith solid; branchlets cylindrical or tetragonal, glabrous, without lenticels, with interpetiolar glands, with or without discontinuous interpetiolar ridge, with epidermis or bark peeling when older; prophylls of axillary buds triangular and minute or ensiform and rigid, without glands. Leaves 2- or 3-foliolate, terminal leaflet often replaced by a trifid tendril, tendrils without adhesive disks, without uncinate apices; leaflets chartaceous or coriaceous, with glands sparsely distributed over lamina, without pellucid punctations, without domatia, petiolules not articulated; petiole cylindrical, never modified into a tendril, not articulated. Inflorescence terminal and/or axillary, a raceme. Flowers zygomorphic, pentamerous; calyx tubular, minutely 5-lobed, coriaceous, puberulent externally, with patelliform glands arranged in lines near margins; corolla white, without nectar guides, narrowly tubular, straight in tube, membranaceous, puberulous to villose externally, with glands arranged in lines on upper portion of tube, lobes 5, imbricate; stamens 4, with well-developed filaments, exserted, anthers puberulous or glabrous, thecae straight, pollen in monads, colpate, with exine psilate; ovary sessile, smooth and lepidote externally, ovules in 1 series on each placenta, stigma lanceolate, glabrous; disk annular. Capsules linear, flattened, straight, coriaceous, woody, with valves 2, glabrous, without lenticels, with scattered glands, without ridges, without wings, smooth, with calyx caducous; seeds winged and linear or wingless and round, with body smooth and glabrous, wings when present opaque. Figure 17A, B.

Number of species, distribution, and habitat. *Pachyptera* includes four species found in wet and flooded forest vegetation from Central America to Bolivia and Brazil.

Pachyptera can be recognized by stems with four phloem wedges in cross-section, bark that is papery and peels as the branchlets age, interpetiolar glands, trifid tendrils, prophylls of the axillary buds that are flattened and ensiform (Fig. 17B) or minute and triangular, white tubular corollas (Fig. 17A, B) with glands arranged in lines in the upper portion of the corolla tube, tubular truncate calyces with conspicuous glands arranged in lines on the upper portion, and linear fruits with glands scattered throughout the surface. The flowers in this genus are apparently all moth pollinated, which suggests that flower form and pollination mode may sometimes be consistent within a clade in Bignonieae.

Pachyptera has not been recognized as a separate genus by recent authors. In particular, Gentry (1979)

included all of *Pachyptera* within his circumscription of *Mansoa* based on several morphological characters that overlap between these genera. Here *Pachyptera* is separated again but circumscribed differently from any previous taxonomy, based on the phylogenetic hypothesis of the tribe Bignonieae (Lohmann, 2006). The genus here includes three species that have been classified in *Pachyptera*, plus one species that was previously separated as *Leucocalantha*. The other species that have been included at various times in *Pachyptera* are here classified in *Mansoa*, as discussed under that genus.

These relationships found by the phylogenetic hypothesis (Lohmann, 2006) were initially surprising, although Santos (1995) noted that the wood anatomy of the plants she studied as *Mansoa kerere* (i.e., *Pachyptera kerere*) is quite different from that of the other *Mansoa* species she analyzed. This wood differed in its four phloem wedges versus multiples of four in the other species of *Mansoa*, its vessels with a long radial alignment, and the silica bodies in its wood. In general presumed relationships based on single morphological characters in this tribe should be taken with caution, but the number of phloem wedges appears to be quite stable phylogenetically in Bignonieae (Pace et al., 2009, 2011) so the inclusion of this species in *Mansoa* was highly suspect all along. *Leucocalantha aromatica* also has four phloem wedges along with the other characteristic features of *P. kerere*. The wood of the other species that have been included in *Mansoa* was also surveyed, and two additional species not previously studied, *M. erythraea* and *M. ventricosa*, were found to have the characters of *Pachyptera*, and are also included in this genus here.

1. **Pachyptera aromatica** (Barb. Rodr.) L. G. Lohmann, comb. nov. Basionym: *Leucocalantha aromatica* Barb. Rodr., Vellosia (ed. 2) 1: 47, t. 7. 1891. *Pachyptera aromatica* (Barb. Rodr.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 770. 2010, nom. nud. invalid. TYPE: Brazil. Amazonas: close to Manaus, July, *J. Barbosa Rodrigues 633* (holotype, not located).

Habitat and distribution. This species is found in wet forest vegetation in Amazonian Brazil (Amazonas, Rondônia).

2. **Pachyptera erythraea** (Dugand) A. H. Gentry, Phytologia 35(3): 186, fig. 2A. 1977. *Pachyptera kerere* var. *erythraea* Dugand, Caldasia 7(31): 16. 1955. *Mansoa erythraea* (Dugand) A. H. Gentry, Ann. Missouri Bot. Gard. 66(4): 782. 1979 [1980]. TYPE: Colombia. Santander: SE of Barranca Bermeja, 9 km from lt. bank of River Opón, 200 m, 26 Aug. 1954, *R. Romero-Castañeda 4727* (holotype, COL-47378 image!).

Habitat and distribution. This species is found in wet forest vegetation in northern Colombia (Antioquia, Santander).

3. **Pachyptera kerere** (Aubl.) Sandwith, Recueil Trav. Bot. Néerl. 34: 219. 1937. *Bignonia kerere* Aubl., Hist. Pl. Guiane 2: 644, tab. 260. 1775, as "*cherere*" in plate. *Bignonia heterophylla* Willd., Sp. Pl. 3: 298. 1800 [1801], nom. superfl. illeg. *Sererea heterophylla* Raf., Sylva Tellur. 107. 1838, nom. superfl. illeg. *Adenocalymma kerere* (Aubl.) Bureau & K. Schum., Fl. Bras. 8(2): 119. 1891. *Petastoma kerere* (Aubl.) Schnee, in H. Pittier et al., Cat. Fl. Venez. 2: 404. 1947. *Mansoa kerere* (Aubl.) A. H. Gentry, Ann. Missouri Bot. Gard. 66(4): 783. 1979 [1980]. TYPE: French Guiana. s. loc., s.d., *J. B. C. F. Aublet s.n.* (holotype, BM!; isotype, LINN-1048/5 fiche!).

Habitat and distribution. This species is found in humid and often flooded forest vegetation (Gentry, 1997) in Belize, Guatemala, El Salvador, Honduras, Costa Rica, Panama, Colombia (Amazonas, Antioquia, Bolívar, Caquetá, Casanare, Chocó, Guianía, Nariño, Vaupes, Vichada), Venezuela (Amazonas, Anzoátegui, Apure, Bolívar, Delta Amacuro, Mérida, Táchira), Guyana, Suriname, French Guiana, Ecuador, Peru (Amazonas, Cusco, Huánuco, Loreto, Madre de Dios, Pasco, Ucayali), Bolivia, and Brazil (Amapá, Amazonas, Mato Grosso, Pará, Rondônia, Roraima).

4. **Pachyptera ventricosa** (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Mansoa ventricosa* A. H. Gentry, Ann. Missouri Bot. Gard. 66(4): 783. 1979 [1980]. TYPE: Brazil. Pará: along Belém–Brasilia hwy., Km. 345, 9 Aug. 1963, *B. Maguire, J. Murça Pires, C. K. Maguire & N. T. Silva 56083* (holotype, MO-2232816!; isotypes, NY-328882!, US-3189002 image!).

Habitat and distribution. This species is known only from wet forest vegetation in a small area of northeastern Brazil (Pará).

XV. Perianthomega Bureau ex Baill., Hist. Pl. 10: 33. 1888. TYPE: *Perianthomega vellozoi* (Vell.) Bureau (lectotype, designated by Bureau [1894: 105]).

Lianas, without dimorphic juvenile growth, without strong odor; stems with 4 phloem arcs in cross-

section, pith solid; branchlets cylindrical, glabrous or lepidote, covered with lenticels, without interpetiolar glands, without interpetiolar ridge, with epidermis not peeling; prophylls of axillary buds triangular and minute, without glands. Leaves biternately compound, without tendrils; leaflets chartaceous, without glands, without pellucid punctations, without domatia, petiolules not articulated; petiole cylindrical, frequently becoming twining and woody, not articulated. Inflorescence terminal, a raceme. Flowers zygomorphic, pentamerous; calyx tubular, shortly 5-lobed, membranaceous, puberulent externally, without glands; corolla white, without nectar guides, tubular, straight in tube, membranaceous, glabrous externally, without glands, lobes 5, imbricate; stamens 4, with well-developed filaments, included, anthers glabrous, thecae straight, pollen in monads, colpate, with exine reticulate; ovary sessile, smooth and puberulous externally, ovules in 1 series on each placenta, stigma rhombic, glabrous; disk annular. Capsules linear, flattened, straight, coriaceous, with valves 2, glabrous, with lenticels, without glands, without ridges, without wings, smooth, with calyx caducous; seeds winged, with body smooth and glabrous, wings hyaline, linear. Figure 17C–E.

Number of species, distribution, and habitat. *Perianthomega* includes one species found in dry vegetation from Bolivia to southeastern Brazil.

Perianthomega is distinguished by its leaves that are always biternately compound, twining petioles modified into a simple tendril (a synapomorphy of the genus), a large (more than 3 cm) tubular calyx, and large white corollas (more than 6 cm long) (Fig. 17C). The only other genera that have species with equally large tubular calyces are *Neojobertia*, *Manaosella*, *Dolichandra*, and *Callichlamys*; however, the species with a similar calyx in those genera all differ in their yellow or red flowers.

Baillon (1888), Schumann (1894), and Bureau and Schumann (1896) included *Perianthomega* in the tribe Bignonieae, but Gentry (1980) considered *Perianthomega* to be intermediate between the tribes Bignonieae and Tecomeae in its wood anatomy and fruit morphology. He later transferred this genus to the tribe Tecomeae, because he thought the wood anatomy lacked the phloem wedges of Bignonieae and the fruit dehiscence seemed to be loculicidal (Gentry, 1992c). However, molecular phylogenetic analyses of the tribe Bignonieae (Lohmann, 2006) as well as the whole Bignoniaceae (Olmstead et al., 2009) found that *Perianthomega* is sister to the core members of Bignonieae (i.e., the tribe as previously circumscribed) and best placed in this tribe. These results are supported by morphology because *Perianthomega* does have the two characters that diagnose this tribe, the septicidal fruits (Fig. 17E) and discontinuous phloem arcs (Fig. 17D).

1. Perianthomega vellozoi Bureau, Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 1893: 105. 1893 [1894], replacement name. *Bignonia perianthomega* Vell., Fl. Flumin. 248. 1825 [1829], Fl. Flumin. Icon. 6: tab. 34, 1827 [1831]. *Memora perianthomega* (Vell.) Miers, Proc. Roy. Hort. Soc. London 3: 185. 1863. TYPE: tab. 34 in Vellozo, Fl. Flumin. Icon. 6, 1827 [1831] (lectotype, designated here).

Nomenclatural note. Botanical names may not be tautonyms (McNeill et al., 2006, Art. 23.4), so Bureau had to create a new species epithet when he classified *Bignonia perianthomega* in a genus with the same name as its species epithet. Gentry in sched. annotated the collection *Glaziou 11246* as the type of *Perianthomega vellozoi*, based on a citation of this collection by Bureau (1894). However, Bureau's name *P. vellozoi* was based on *B. perianthomega* Vell., and therefore must be typified by Vellozo's materials. In this particular work Bureau cited a voucher specimen, usually a Glaziou collection, for each species he listed, but he did not present any discussion or indication that he intended to designate any types for these names. Vellozo's name is here lectotypified by his original material, which has priority over a new collection (McNeill et al., 2006, Art. 9.10).

Habitat and distribution. This species is found in dry vegetation in the Andean foothills of southern Bolivia and in northern Paraguay and Brazil (Espírito Santo, Mato Grosso, Mato Grosso do Sul, Minas Gerais).

XVI. Pleonotoma Miers, Proc. Roy. Hort. Soc. London. 3: 184. 1863. TYPE: *Pleonotoma jasminifolia* (Kunth) Miers (lectotype, designated by Sandwith [1962: 457]).

Nestoria Urb., Ber. Deutsch. Bot. Ges. 34: 751. 1916. TYPE: *Nestoria obtusifoliolata* (Bureau & K. Schum.) Urb. [= *Pleonotoma albiflora* (Salzm. ex DC.) A. H. Gentry].

Kuhlmannia J. C. Gomes, Notul. Syst. (Paris) 15: 222. 1956. TYPE: *Kuhlmannia colatinensis* J. C. Gomes [= *Pleonotoma albiflora* (Salzm. ex DC.) A. H. Gentry].

Lianas, without dimorphic juvenile growth, without strong odor; stems with 4 phloem wedges in cross-section, pith solid; branchlets tetragonal with angles acute and winged, glabrous (puberulous to pubescent), without lenticels, without interpetiolar glands,

with discontinuous interpetiolar ridge, with epidermis or bark peeling at least on stem angles; prophylls of axillary buds foliaceous, with glands. Leaves biternately compound or biternately pinnate, terminal division often replaced by a trifid tendril, tendrils without adhesive disks, without uncinate apices; leaflets chartaceous, with glands distributed over lamina, without pellucid punctations, without domatia, petiolules not articulated; petiole tetragonal, never modified into a tendril, not articulated. Inflorescence terminal and/or axillary, an elongated (congested) raceme. Flowers zygomorphic, pentamerous; calyx cupular or tubular, shortly 5-lobed, membranaceous, glabrous to villose externally, with glands in lines near margins; corolla white, cream, or yellow, without nectar guides, tubular, straight in tube, membranaceous, glabrous to puberulous externally, without glands, lobes 5, imbricate; stamens 4, with well-developed filaments, included, anthers glabrous, thecae straight, pollen in monads, colpate, with exine reticulate; ovary sessile, smooth and lepidote externally, ovules in 2 series on each placenta, stigma rhombic, glabrous; disk annular. Capsules linear, flattened, straight, woody, with valves 2, glabrous, without lenticels, without glands, without wings, smooth, with calyx caducous; seeds winged, with body smooth and glabrous, wings opaque, linear.

Number of species, distribution, and habitat. *Pleonotoma* includes 17 species found in wet to dry forest, caatinga, and cerrado vegetation from northern Central America to southern Brazil.

Pleonotoma is strongly supported as monophyletic in the phylogenetic hypothesis of Bignonieae (Lohmann, 2006) and readily identifiable based on vegetative characters. It is the only genus in the tribe with the combination of markedly tetragonal stems with the corners winged (a synapomorphy of the genus) and the epidermis or bark peeling especially along these corners, tetragonal petioles (another synapomorphy), and biternately compound or biternately pinnate leaves. The showy white to yellow, tubular flowers of *Pleonotoma* are likely pollinated by bees and hawkmoths (Gentry, 1974a). The fruits of *Pleonotoma* are linear and the seeds are unusually large, more than 10 cm long. Only *Neojobertia* has equally long seeds; it can be separated by its hexagonal stems.

Pleonotoma has sometimes been included within *Memora* (which is here included within *Adenocalymma*) based on its biternately compound or biternately pinnate leaves and racemose inflorescences. However, the phylogenetic hypothesis of Bignonieae (Lohmann, 2006) found that these genera are not closely related, and their separation is also supported by morphological characters: *Pleonotoma* lacks the volcano-shaped glands that are a synapomorphy of *Adenocalymma* (Fig. 3A); also *Pleonotoma* has ovules that are biseriate on the placentas and colpate pollen, in contrast to the uniseriate ovules and inaperturate pollen of *Adenocalymma*.

1. Pleonotoma albiflora (Salzm. ex DC.) A. H. Gentry, Ann. Missouri Bot. Gard. 63(1): 71. 1976. *Bignonia albiflora* Salzm. ex DC., in A. DC., Prodr. 9: 167. 1845. *Memora albiflora* (Salzm. ex DC.) Miers, Proc. Roy. Hort. Soc. London 3: 185. 1863. *Nestoria albiflora* (Salzm. ex DC.) Sandwith, Candollea 7: 248. 1936. TYPE: Brazil. Bahia: s. loc., 1830, *P. Salzmann 346* (holotype, G-DC!, G-DC as photo F neg. 7674 at MO-1692877!; isotypes, P [barcode] P00410842!, P [barcode] P00410841!).

Habitat and distribution. This species is found in evergreen lowland forest vegetation (Gentry, 1997) and Atlantic forest vegetation in Venezuela (Amazonas, Bolívar, Delta Amacuro), Guyana, Suriname, French Guiana, and Brazil (Amazonas, Bahia, Espírito Santo, Pará).

2. Pleonotoma bracteata A. H. Gentry, Phytologia 46(4): 213. 1980. TYPE: Brazil. Amazonas: Óbidos, Serra da Escama, 9 Sep. 1928, *A. J. Sampaio 4909* (holotype, R not seen; isotype, MO-2305576!).

Habitat and distribution. This species is found in wet forest vegetation in northeastern Brazil (Amazonas, Pará).

3. Pleonotoma castelnaei (Bureau) Sandwith, Kew Bull. 13: 438. 1958 [1959]. *Pleonotoma variabilis* var. *castelnaei* Bureau, Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 1893: 105. 1893 [1894]. TYPE: Brazil. s. loc., s.d., *A. Glaziou 9952* (holotype, P [barcode] P00410840!, P as photo K neg. 3127 at K!; isotype, C!).

Habitat and distribution. This species is found in dry caatinga and cerrado vegetation in eastern Brazil (Bahia, Maranhão, Minas Gerais, Piauí).

4. Pleonotoma clematis (Kunth) Miers, Proc. Roy. Hort. Soc. London 3: 184. 1863. *Bignonia clematis* Kunth, Nov. Gen. Sp. (quarto ed.) 3: 141. 1818 [1819]. TYPE: Venezuela. Guárico: Llanos de Calabozo, betw. Calabozo & River Guárico, Apr., *F. W. H. A. von Humboldt & A. J. A. Bonpland 777* (holotype, P-Bonpl.!, P-Bonpl.

as photo F neg. 39409 at MO-1692932!; isotype, B-W-11473!).

Habitat and distribution. This species is found in semideciduous to deciduous forest vegetation (Gentry, 1997) in Colombia (Norte de Santander, Vaupés), Venezuela (Amazonas, Anzoátegui, Apure, Bolívar, Guárico, Miranda, Monagas, Sucre), Guyana, Suriname, French Guiana, and Brazil (Amapá, Amazonas, Rondônia, Roraima).

5. Pleonotoma dendrotricha Sandwith, Mem. New York Bot. Gard. 10(1): 141. 1958. TYPE: Venezuela. Amazonas: Río Orinoco, 1–10 km below San Fernando de Atabapo, 150 m, 11 May 1954, *J. Silverio Level 67* (holotype, K!; isotype, NY [barcode] NY00328900!).

Habitat and distribution. This species is found in humid forest vegetation, often on white sand substrates (Gentry, 1997), in Colombia (Guainía, Vaupés), Venezuela (Amazonas), French Guiana, Peru (Loreto, Puno, Ucayali), Bolivia, and Brazil (Amazonas, Pará, Rondônia).

6. Pleonotoma echitidea Sprague & Sandwith, Bull. Misc. Inform. Kew 1934: 102. 1934. TYPE: British Guiana [Guyana]. Upper Demerara River, Sep. 1887, *G. S. Jenman 4124* (holotype, K!).

Habitat and distribution. This species is found in wet forest vegetation in Guyana and Suriname.

7. Pleonotoma exserta A. H. Gentry, Mem. New York Bot. Gard. 29(1): 281, fig. 124D. 1978. TYPE: Venezuela. Amazonas: rd. from San Fernando de Atabapo to Santa Barbara, 12–40 km from San Fernando, 110 m, 24 Mar. 1974, *A. H. Gentry & S. S. Tillett 10865* (holotype, MO-2241755!; isotypes, MO-2241753!, MO-2241754!, MBM not seen, NY [barcode] NY01085444!, VEN not seen, XAL not seen).

Habitat and distribution. This species is found in savanna vegetation on white sand substrates in Colombia (Caquetá, Guainía), Venezuela (Amazonas, Bolívar), and Brazil (Amazonas).

8. Pleonotoma fissicalyx B. M. Gomes & Proença, Kew Bull. 65(2): 272, fig. 1. 2010. TYPE: Brazil. Pará: ca. 18 km E of Tucuruí & Tocantins River, by BR-263, 3°30′S, 49°32′W, 28 Oct. 1981, *D. C. Daly, R. Callejas, M. G. da Silva, E. L. Taylor, C. Rosario & D. M. R. dos Santos 991* (holotype, MG not seen; isotypes, MO-3002537!, NY not seen).

Taxonomic note. This material was first identified as a new species of *Pleonotoma* by A. H. Gentry, who annotated specimens in sched. with the unpublished epithet "macrosiphon."

Habitat and distribution. This species is found in humid vegetation on white sand substrates in northeastern Brazil (Pará).

9. Pleonotoma fluminensis (Vell.) A. H. Gentry, Taxon 24(4): 342. 1975. *Bignonia fluminensis* Vell., Fl. Flumin. 246. 1825 [1829]; Fl. Flumin. Icon. 6: tab. 39. 1827 [1831]. *Memora fluminensis* (Vell.) Miers, Proc. Roy. Hort. Soc. London 3: 185. 1863. TYPE: tab. 39 in Vellozo, Fl. Flumin. Icon. 6, 1827 [1831] (lectotype, designated here).

Habitat and distribution. This species is found in Atlantic forest vegetation in southeastern Brazil (Minas Gerais, São Paulo).

10. Pleonotoma jasminifolia (Kunth) Miers, Proc. Roy. Hort. Soc. London 3: 184. 1863, *jasminifolium*, orth. var. *Bignonia jasminifolia* Kunth, Nov. Gen. Sp. Pl. (quarto ed.) 3: 141. 1818 [1819]. TYPE: Venezuela. Amazonas: San Fernando, betw. rivers Orinoco & Atabapo, May 1800, *F. W. H. A. von Humboldt & A. J. A. Bonpland 1010* (holotype, P-Bonpl.!, P-Bonpl. as photo F neg. 39413 at MO-1692926!; isotype, B-W-11471!).

Habitat and distribution. This species is found in wet forest vegetation, usually on sandy substrates (Gentry, 1997), in Colombia (Amazonas, Caquetá, Cundinamarca, Meta, Vaupés, Vichada), Venezuela (Amazonas, Bolívar), and Brazil (Amazonas, Pará, Rondônia).

11. Pleonotoma longiflora B. M. Gomes & Proença, Kew Bull. 65(2): 273, fig. 2. 2010. TYPE: Brazil. Amazonas: rd. Manaus–Itacoatiara, Km. 26, Ducke forest reserve, 2°53′S, 59°58′W, 9 July 1997, *R. C. Forzza 290* (holotype, UB not seen; isotypes, INPA-191275 not seen, MO-6223722!, NY not seen).

Habitat and distribution. This species is found in wet lowland forest vegetation in the central Amazon basin of Brazil (Amazonas).

12. Pleonotoma melioides (S. Moore) A. H. Gentry, Ann. Missouri Bot. Gard. 63(1): 42. 1976. *Bignonia melioides* S. Moore, Trans. Linn. Soc. London, Bot., Ser. 2, 4: 414. 1895. TYPE: Brazil. Mato Grosso: near Santa Cruz, Oct.

1891–1892, *S. Moore 406* (holotype, BM [barcode] 000882583 image!).

Habitat and distribution. This species is found in wet forest vegetation and Atlantic forest vegetation in Colombia (Amazonas, Caquetá), Ecuador, Peru (Cusco, Huánuco, Junín, Loreto, Madre de Dios, Pasco, Puno, San Martín, Ucayali), Bolivia, and Brazil (Acre, Amazonas, Bahia, Espírito Santo, Goiás, Maranhão, Mato Grosso, Pará, Rondônia).

13. Pleonotoma orientalis Sandwith, Brittonia 3(2): 92. 1938. TYPE: Brazil. Maranhão: Ilha do Trauira, Maracassumé River, 30 Aug. 1932, *R. Froes 1840* (holotype, NY [barcode] NY00328903!; isotypes, BM!, F-707102 image!, K!, MO-1041515!, P [barcode] P00481544!, US-1663967 image!).

Habitat and distribution. This species is found on rocky outcrops in central Brazil (Bahia, Goiás, Maranhão, Pará).

14. Pleonotoma pavettiflora Sandwith, Bull. Misc. Inform. Kew 1934: 103. 1934. TYPE: Brazil. Mato Grosso: NE of Cuiabá, Burity, 2250 ft., June 1927, *G. D. Smith 294* (holotype, K!).

Habitat and distribution. This species is found in humid forest vegetation in Bolivia and Brazil (Acre, Mato Grosso, Rondônia).

15. Pleonotoma stichadenia K. Schum., Nat. Pflanzenfam. 4(3b): 226. 1894, as "*stichadenium*." TYPE: Brazil: Espírito Santo, betw. Campos & Vitória, s.d., *F. Sellow 417* (holotype, B†, B as photo F neg. 18436 at MO-1693040!; lectotype, designated here, K [barcode] K000449777!).

Nomenclatural note. The presumed holotype specimen documented in the collection at B by a photograph has been destroyed. No duplicates were found at P, where Schumann's collaborator Bureau worked; consequently, the duplicate at K is here chosen as the lectotype.

Habitat and distribution. This species is found in humid vegetation and Atlantic forest vegetation in Brazil (Bahia, Ceará, Espírito Santo, Minas Gerais, Pará, Pernambuco, Rio de Janeiro).

16. Pleonotoma tetraquetra (Cham.) Bureau, J. Soc. Imp. Centr. Hort., Ser. II, 2: 156. 1868. *Bignonia tetraquetra* Cham., Linnaea 7: 675. 1832 [1833]. *Memora tetraquetra* (Cham.) Miers, Proc. Hort. Soc. London 3: 185. 1863. TYPE: Brazil. Minas Gerais: Lagoa Santa, 1840, *F. Sellow s.n.* (holotype, LE not seen; isotypes, B†, B as photo F neg. 18437 at MO-1693041!, K!, NY [barcode] NY00328752!).

Habitat and distribution. This species is found in Atlantic forest vegetation in southeastern Brazil (Minas Gerais, Rio de Janeiro, São Paulo).

17. Pleonotoma variabilis (Jacq.) Miers, Proc. Hort. Soc. London 3: 184. 1863. *Bignonia variabilis* Jacq., Pl. Hort. Schoenb. 2: 45, tab. 212. 1797. TYPE: Venezuela. Caracas, s.d., *N. J. Jacquin s.n.* (holotype, W!).

Habitat and distribution. This species is found in evergreen lowland forest vegetation (Gentry, 1997) in Guatemala, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Amazonas, Antioquia, Bolívar, Caldas, Caquetá, Chocó, Córdoba, Cundinamarca, La Guajira, Magdalena, Santander, Tolima), Venezuela (Amazonas, Apure, Aragua, Bolívar, Carabobo, Distrito Federal, Falcón, Guárico, Lara, Mérida, Miranda, Monagas, Táchira, Trujillo, Yaracuy, Zulia), Trinidad and Tobago, Ecuador, Peru (Loreto, Madre de Dios, Pasco, Ucayali), Bolivia, and Brazil (Acre, Amapá, Amazonas, Pará).

XVII. Pyrostegia C. Presl, Abh. Köenigl. Böhm. Ges. Wiss., ser. 5, 3: 523. 1845. TYPE: *Pyrostegia ignea* (Vell.) C. Presl [= *Pyrostegia venusta* (Ker Gawl) Miers].

Lianas, without dimorphic juvenile growth, without strong odor; stems with phloem wedges in multiples of 4 in cross-section, pith solid; branchlets hexagonal, glabrous to puberulous, without lenticels, without interpetiolar glands, with discontinuous interpetiolar ridge, with epidermis not peeling; prophylls of axillary buds triangular and minute, without glands. Leaves 2- or 3-foliolate, terminal leaflet often replaced by a trifid tendril, tendrils without adhesive disks, without uncinate apices; leaflets chartaceous, with glands sparsely distributed over lamina or grouped in axils of veins, with pellucid punctations, without domatia, petiolules not articulated; petiole cylindrical, never modified into a tendril, not articulated. Inflorescence terminal and/or axillary, a corymbiform cyme. Flowers zygomorphic, pentamerous; calyx cupular, shortly 5-lobed, membranaceous, puberulent externally, without glands; corolla orange-red or white, without nectar guides, narrowly tubular, straight in tube, membranaceous, glabrous externally except puberulous on margins of lobes, without glands, lobes 5, valvate at base and imbricate above; stamens 4, with well-developed filaments, exserted, anthers glabrous,

thecae straight, pollen in monads, colpate, with exine reticulate; ovary sessile, smooth and lepidote externally, ovules in 1 series on each placenta, stigma rhombic, glabrous; disk annular. Capsules linear, flattened, straight, coriaceous, with valves 2, glabrous, with lenticels, without glands, without wings, smooth, with calyx persistent; seeds winged, with body smooth and glabrous, wings hyaline, linear.

Number of species, distribution, and habitat. *Pyrostegia* includes two species found in dry to humid vegetation from Mexico to Argentina.

Pyrostegia can be recognized by its minute triangular prophylls of the axillary buds, hexagonal stems, 2- or 3-foliolate and pellucid-punctate leaves with the terminal leaflet often replaced by a trifid tendril, inflorescences arranged in corymbose cymes (a synapomorphy of the genus), and unusual corolla lobe arrangement. The corolla lobes are valvate in bud at their bases, but then shift to imbricate at their apices (Pool, 2008). This arrangement is a synapomorphy of the genus and a unique feature in this tribe. The flowers are variously orange and hummingbird pollinated, or white and moth pollinated (Gentry, 1990).

The genus *Pyrostegia* is circumscribed here similarly to Pool (2008), except *P. cinerea* is classified in *Cuspidaria* based on the phylogenetic hypothesis of the tribe Bignonieae (Lohmann, 2006). Pellucid-punctate leaves are also found in *Stizophyllum*, but *Stizophyllum* can be recognized by its distinctive hollow stems, versus solid stems in *Pyrostegia*.

1. Pyrostegia millingtonioides Sandwith, Kew Bull. 15: 464. 1962. TYPE: Brazil. Pará: Óbidos, 23 July 1912, *A. Ducke s.n. MG-12046* (holotype, K!; isotype, MG-12046 not seen).

Habitat and distribution. This species is found apparently infrequently in disturbed and successional areas in humid vegetation in northeastern Brazil (Maranhão, Pará).

2. Pyrostegia venusta (Ker Gawl.) Miers, Proc. Roy. Hort. Soc. London 3: 188. 1863. *Bignonia venusta* Ker Gawl., Bot. Reg. 3, tab. 249. 1817 [1818]. *Tecoma venusta* (Ker Gawl.) Lem., Hort. Universel 5: 1. 1843. TYPE: tab. 249 in Ker Gawler, Bot. Reg. 3, 1818, "drawn from cultivated specimens growing at British Gardens," i.e., cultivated at Coombe Wood, England, from seeds collected in Rio de Janeiro, Brazil (lectotype, designated by Sandwith & Hunt [1974: 75]).

Pyrostegia dichotoma Miers ex K. Schum., Nat. Pflanzenfam. 4(3b): 223. 1894, syn. nov. TYPE: Peru. San Martín: Tarapoto, 1855–1856, *R. Spruce 3930* (lectotype, designated by Pool [2008: 502], G not seen, G as photo F neg. 26203 not seen; isolectotypes, BM not seen, BR not seen, G-DC not seen, K not seen, NY-278040!, P not seen, W not seen).

Tynanthus igneus Barb. Rodr., Vellosia, ed. 2, 1: 50, 3: ser. 2: tab. 10. 1891, non *Pyrostegia ignea* (Vell.) C. Presl, 1845. TYPE: Brazil. Amazonas: ad ripas Rio Negro prope Manaus, *J. Barbosa Rodrigues s.n.* (holotype, INPA not seen).

Nomenclatural note. Pool (2008: 498, 501) noted that the Amazonian specimens of Barbosa Rodrigues have been sought for many years and are all considered to be lost, and accordingly she designated a lectotype for *Tynanthus igneus* and selected the illustration in the protologue of this name. However, Pool (pers. comm.) subsequently discovered that a single Barbosa Rodrigues collection did survive at INPA, as detailed by Mori and Ferreira (1987), and this specimen coincidentally is the type of *T. igneus*. Mori and Ferreira confirmed that all the Amazonian specimens stored in the INPA herbarium were lost, but Barbosa Rodrigues's library there survived and this one specimen was for some reason left in the library.

Taxonomic note. *Pyrostegia dichotoma* and *P. venusta* were separated by Pool (2008) based on the level of staminode insertion and details of the stem trichomes. However, field observations on the flowers (L. G. Lohmann, pers. obs.) found extensive variation in the level of staminode insertion within local populations of these plants in various parts of Brazilian Amazonia, and found no correlation between this and any other features or habitat preferences. The pubescence details cited by Pool do not alone support the separation of two species here, and these names are thus considered synonyms. Further study with additional sources of data will be necessary to understand this species complex.

Habitat and distribution. This species is widely and commonly found in dry to humid lowland forests in Mexico (Chiapas, México, Michoacán, Morelos, Oaxaca, Sinaloa, Veracruz), Guatemala, El Salvador, Honduras, Costa Rica, Panama, Colombia (Caquetá, Meta, Valle del Cauca), Venezuela (Amazonas, Bolívar, Delta Amacuro, Distrito Federal, Miranda, Sucre, Táchira), Guyana, Suriname, Ecuador, Peru (Cusco, Huánuco, La Libertad, Lambayeque, Lima, Loreto, Madre de Dios, Pasco, San Martín, Ucayali), Bolivia, Paraguay, Brazil (Acre, Amazonas, Bahia, Ceará, Espírito Santo, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraná, Pernambuco, Rio de Janeiro, Rio Grande do Sul, Rondônia,

Roraima, Santa Catarina, São Paulo, Tocantins), and Argentina (Corrientes, Jujuy, Misiones, Tucumán), and is widely cultivated elsewhere.

XVIII. Stizophyllum Miers, Proc. Roy. Hort. Soc. London. 3: 197. 1863. TYPE: *Stizophyllum perforatum* (Cham.) Miers (lectotype, designated by Baillon [1888: 30]).

Lianas, without dimorphic juvenile growth, without strong odor; stems with 4 phloem wedges in cross-section, with hollow pith; branchlets cylindrical, pubescent, without lenticels, without interpetiolar glands, without interpetiolar ridge, with epidermis not peeling; prophylls of axillary buds foliaceous, without glands. Leaves 2- or 3-foliolate, terminal leaflet often replaced by a trifid tendril, tendrils without adhesive disks, without uncinate apices; leaflets chartaceous, with glands sparsely distributed over lamina, with pellucid punctations, without domatia, petiolules not articulated; petiole cylindrical, never modified into a tendril, not articulated. Inflorescence axillary and/or terminal, a lax to congested, few-flowered raceme. Flowers zygomorphic, pentamerous; calyx urceolate, irregularly bilabiate to 5-lobed, membranaceous, puberulent or villose externally, without glands; corolla white, pink, or magenta, without nectar guides, infundibuliform, straight in tube, membranaceous, pubescent externally, without glands, lobes 5, imbricate; stamens 4, with well-developed filaments, included, anthers glabrous, thecae straight, pollen in monads, colpate, with exine reticulate; ovary sessile, smooth and lepidote externally, ovules in 2 series on each placenta, stigmas elliptic, glabrous; disk annular. Capsules linear, narrow, flattened, straight, coriaceous, with valves 2, puberulous to villose, without lenticels, without glands, without wings, smooth, with calyx persistent; seeds winged, with body smooth and glabrous, wings hyaline, linear.

Number of species, distribution, and habitat. *Stizophyllum* includes three species found in wet to dry forest and disturbed vegetation from Mexico to southern Brazil. Species of *Stizophyllum* usually are pioneers, occupying large patches in disturbed areas, borders of forests, and other secondary vegetation.

The circumscription of *Stizophyllum* has not been controversial. The genus is easily recognizable by its hollow stems and branchlets (both synapomorphies of the genus), pellucid-punctate leaflets, and trifid tendrils. The racemose inflorescences, urceolate calyx, usually pink to magenta corolla, and linear fruits are also useful in its identification.

1. Stizophyllum inaequilaterum Bureau & K. Schum., Fl. Bras. 8(2): 221. 1896. TYPE: Peru. Loreto: Maynas, 1831, *E. F. Poeppig 1827* (holotype, W!, W as photo F neg. 32877 at MO-1693064!; isotypes, F-875529 image!, IT not seen).

Habitat and distribution. This species is found in humid lowland to premontane forest vegetation (Gentry, 1997) and is particularly abundant in disturbed and second-growth vegetation, in Nicaragua, Costa Rica, Panama, Colombia (Antioquia, Chocó, Meta, Valle del Cauca), Venezuela (Amazonas, Bolívar), Suriname, French Guiana, Ecuador, Peru (Amazonas, Huánuco, Loreto, Madre de Dios, Pasco, San Martín, Ucayali), Bolivia, and Brazil (Acre, Amapá, Amazonas, Pará, Rondônia, Roraima).

2. Stizophyllum perforatum (Cham.) Miers, Proc. Roy. Hort. Soc. London 3: 198. 1863. *Bignonia perforata* Cham., Linnaea 7: 667. 1832 [1833]. TYPE: Brazil. s. loc., 1840, *F. Sellow s.n.* (holotype, LE not seen; isotypes, B†, K!, NY [barcode] NY00313145!).

Nomenclatural note. The names *Bignonia perforata* and *B. physaloides* Cham. were published simultaneously; these were synonymized by Bureau and Schumann (1896: 220), who chose *B. perforata*.

Habitat and distribution. This species is found widely but apparently sporadically in humid forest and disturbed vegetation in Mexico (Campeche), Guatemala, Costa Rica, Panama, Guyana, Brazil (Bahia, Ceará, Distrito Federal, Espírito Santo, Goiás, Maranhão, Mato Grosso, Minas Gerais, Pará, Paraná, Piauí, Rio de Janeiro, São Paulo).

3. Stizophyllum riparium (Kunth) Sandwith, Lilloa 3: 462. 1938. *Bignonia riparia* Kunth, Nov. Gen. Sp. (quarto ed.) 3: 138. 1818 [1819]. TYPE: Colombia. Bolívar: Río Magdalena, near Mompox, May 1801, *F. W. H. A. von Humboldt & A. J. A. Bonpland s.n.* (holotype, P-Bonpl.!, P-Bonpl. as photo F neg. 39424 at MO-1692925!).

Habitat and distribution. This species is found in humid forest and disturbed vegetation in Mexico (Campeche, Chiapas, Oaxaca, Quintana Roo, Veracruz, Yucatán), Belize, Guatemala, El Salvador, Costa Rica, Panama, Colombia (Amazonas, Antioquia, Bolívar, Boyacá, Caquetá, Chocó, Cundinamarca, Santander, Sucre, Tolima), Venezuela (Amazonas, Barinas, Bolívar, Táchira), Suriname, French Guiana, Ecuador, Peru (Amazonas, Cusco, Huánuco, Junín, Loreto, Madre de Dios, Pasco, Puno, San Martín, Ucayali), Bolivia, and Brazil (Acre, Amapá, Ama-

zonas, Bahia, Espírito Santo, Maranhão, Mato Grosso, Pará, Rio de Janeiro, São Paulo).

XIX. Tanaecium Sw., Prodr. Veg. Ind. Occ. 6: 91. 1788, emend. L. G. Lohmann. TYPE: *Tanaecium jaroba* Sw.

Paragonia Bureau, Bull. Soc. Bot. France 19: 17. 1872, syn. nov. TYPE: *Bignonia lenta* Mart. ex DC. [= *Tanaecium pyramidatum* (Rich.) L. G. Lohmann].

Sanhilaria Baill., Hist. Pl. 10: 27. 1888. *Hilariophyton* Pichon, Bull. Soc. Bot. France 92: 228. 1946, nom. illeg. superfl. TYPE: *Sanhilaria brasiliensis* Baill. [≡ *Tanaecium brasiliensis* (Baill.) L. G. Lohmann].

Ceratophytum Pittier, J. Wash. Acad. Sci. 18: 62. 1928, syn. nov. TYPE: *Ceratophytum capricorne* Pittier [= *Tanaecium tetragonolobum* (Jacq.) L. G. Lohmann].

Periarrabidaea A. Samp., Ann. Acad. Brasil. Sci. 6: 175. 1934, syn. nov. TYPE: *Periarrabidaea truncata* A. Samp. (lectotype, designated here) [≡ *Tanaecium truncatum* (A. Samp.) L. G. Lohmann].

Spathicalyx J. C. Gomes, Notul. Syst. (Paris) 15: 220. 1956, syn. nov. TYPE: *Spathicalyx kuhlmannii* J. C. Gomes [= *Tanaecium duckei* (A. Samp.) L. G. Lohmann].

Pseudocatalpa A. H. Gentry, Brittonia 25(3): 241. 1973, syn. nov. TYPE: *Pseudocatalpa caudiculata* (Standl.) A. H. Gentry [≡ *Tanaecium caudiculatum* (Standl.) L. G. Lohmann].

Lianas, without dimorphic juvenile growth, without strong odor; stems with 4 phloem wedges in cross-section, pith solid; branchlets cylindrical (tetragonal in *Tanaecium caudiculatum*), glabrous or pubescent, with sparsely distributed lenticels, with or without interpetiolar glands, with discontinuous interpetiolar ridge, with epidermis not peeling; prophylls of axillary buds subulate and/or bromeliad-like, with or without glands. Leaves 2- or 3-foliolate, terminal leaflet often replaced by a simple, minutely bifid, or trifid tendril, tendrils without adhesive disks, without uncinate apices; leaflets chartaceous to subcoriaceous, with glands sparsely distributed over lamina (grouped in axils of veins in *T. xanthophyllum*), without pellucid punctations, with or without domatia, petiolules not articulated; petiole cylindrical, never modified into a tendril, not articulated. Inflorescence terminal and/or axillary, a thyrse or cyme. Flowers zygomorphic, pentamerous; calyx cupular, bilabiate, coriaceous, puberulous or villose externally, with fields of glands or without glands; corolla yellow, white, pink, or magenta, without nectar guides, tubular or infundibuliform, straight in tube, membranaceous, villose externally, without glands, lobes 5, imbricate; stamens 4 (2 in *T. caudiculatum*), with well-developed filaments, included (exserted in *T. caudiculatum*), anthers glabrous, thecae straight, pollen in monads, colpate, with exine psilate or reticulate; ovary sessile, smooth and lepidote externally, ovules in 1(2) series on each placenta, stigma ellipsoid, glabrous; disk annular. Capsules linear (elliptic in *T. caudiculatum*), flattened or inflated, straight, woody or coriaceous, with valves 2, puberulous, with lenticels, without glands, without wings, smooth, with calyx caducous; seeds winged or wingless, with body smooth and glabrous, wings hyaline or opaque, linear, wingless seeds corky and rounded. Figure 18A–C.

Nomenclatural notes. Baillon (1888) cited *Bignonia lenta* as the type of *Paragonia* but did not explicitly associate the name of the genus with the epithet of this species as required for valid publication of a combination (McNeill et al., 2006, Art. 33.1). The name *B. lenta* has since been considered a synonym of *P. pyramidata* (Rich.) Bureau, and consequently the name *B. lenta* was never transferred to *Paragonia*; however, this does not preclude its being the type of *Paragonia*.

Pichon (1946) considered the name *Sanhilaria* Baill. to be a later homonym of *Sanhilaria* Leandro ex DC., a name supposedly published in 1838 for a genus of Asteraceae, and he therefore published the replacement name *Hilariophyton* for the genus of Bignoniaceae. This conclusion was based on his survey of annotations of herbarium specimens deposited at P. However, the supposedly earlier name was never validly published. It was mentioned in one published work, where it was cited as an unpublished name that had been informally used for plants of *Stifftia* J. K. Mikan (Asteraceae), but this mention does not constitute valid publication.

The genus *Periarrabidaea* was described with two species, and apparently no lectotype has been designated until now.

Number of species, distribution, and habitat. *Tanaecium* includes 17 species found in wet to dry forest vegetation from Mexico and the Antilles to Argentina.

Tanaecium is well characterized by the prophylls of the axillary buds that are usually mixed subulate and bromeliad-like (a synapomorphy of the genus; Fig. 18B), wood with four phloem wedges in cross-section, well-developed interpetiolar ridges, leaflets with straight-percurrent venation and sparsely distributed glands, thick bilabiate calyx, villose corolla, colpate pollen, pubescent fruits, and opaque corky seeds. Well-developed interpetiolar glands and terminal inflorescences are also generally present.

Tanaecium is here circumscribed more broadly than previously, to include the species usually classified here along with four species that were previously placed in *Arrabidaea* and also the formerly recognized genera *Ceratophytum*, *Pseudocatalpa*, *Spathicalyx*, *Paragonia*, and *Periarrabidaea*. Gentry (1973a) previously suggested that *Tanaecium*, *Para-*

gonia, and *Ceratophytum* were closely related based on their trifid tendrils, white flowers, wood with four phloem wedges, and similar growth form as what he termed giant bush ropes. The close relationship of these and *Pseudocatalpa*, *Periarrabidaea*, *Spathicalyx*, and the several species previously placed in *Arrabidaea* was not suspected before, but is well supported by molecular phylogenetic data (Lohmann, 2006) and the morphological characters listed above. *Pseudocatalpa caudiculata* Standl. was always considered unusual in Bignonieae in its flowers with only two stamens, but it has the diagnostic morphological features of *Tanaecium*.

1. Tanaecium affine (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea affinis* A. H. Gentry, Novon 2(2): 159. 1992. TYPE: Ecuador. Sucumbíos: banks of Lake Agrio, 250 m, 0°07′N 76°55′W, 1 Apr. 1980, *J. Brandbyge & E. Asanza 30393* (holotype, MO-3096367!; isotypes, AAU not seen, AAU as photocopy at MO-3003444!, NY-106!).

Habitat and distribution. This species is found in forest vegetation in Colombia (Amazonas, Meta), Ecuador, Peru (Amazonas, Junín, Loreto, Madre de Dios, Pasco, Puno), and Bolivia.

2. Tanaecium apiculatum A. H. Gentry, Ann. Missouri Bot. Gard. 63(1): 58, fig. 4. 1976. TYPE: Venezuela. Monagas: Caicara, 15 May 1952, *F. D. Smith 226* (holotype, US-2121468 not seen, US-2121468 as photocopy at MO-2228969!; isotype, US-2121469 image!, US-2121469 as photocopy at MO-2228970!).

Habitat and distribution. This species is found in wet forest vegetation in eastern Venezuela (Monagas).

3. Tanaecium bilabiatum (Sprague) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 274. 2008. *Memora bilabiata* Sprague, Bull. Herb. Boissier, sér. 2, 6: 375. 1906. *Adenocalymma bilabiatum* (Sprague) Sandwith, Recueil Trav. Bot. Néerl. 34: 213. 1937. *Arrabidaea bilabiata* (Sprague) Sandwith, Kew Bull. 22: 418. 1968. TYPE: Brazil. Amazonas: Manaus, s.d., *R. Spruce 1783* (holotype, K not seen).

Habitat and distribution. This species is found in wet and flooded lowland forest vegetation (Gentry, 1997) in Colombia (Amazonas, Arauca, Guainía), Venezuela (Amazonas, Apure, Bolívar, Delta Amacuro, Guárico, Monagas, Sucre), Guyana, Suriname, French Guiana, Peru (Loreto, Madre de Dios), Bolivia, and Brazil (Acre, Amapá, Amazonas, Pará, Roraima).

4. Tanaecium caudiculatum (Standl.) L. G. Lohmann, comb. nov. Basionym: *Petastoma caudiculatum* Standl., Field Mus. Nat. Hist., Bot Ser. 11(4): 141. 1932. *Mussatia caudiculata* (Standl.) Seibert, Publ. Carnegie Inst. Wash. 522: 418. 1940. *Pseudocatalpa caudiculata* (Standl.) A. H. Gentry, Brittonia 25(3): 241. 1973. TYPE: Belize. Nine Mile, Stann Creek Railway, 30 m, 22 Mar. 1932, *W. A. Schipp S-297* (holotype, F-657811 image!; isotype, F-657912 image!).

Habitat and distribution. This species is found in wet forest vegetation in Mexico (Oaxaca, Veracruz), Belize, and Guatemala.

5. Tanaecium crucigerum Seem., Bonplandia (Hannover) 4: 127. 1856. TYPE: Lesser Antilles. Dominica, s. loc., s.d., *J. Imray 95* (lectotype, selected by Howard [1989: 334], K not seen).

Nomenclatural note. Some confusion surrounds the nomenclatural history and typification of this name. *Bignonia crucigera* L. was described in the first edition of the *Species Plantarum* (Linnaeus, 1753), and was lectotypified following its circumscription in this work by Barrie et al. (1991) so its identity is clear. In a later edition of the *Species Plantarum*, Linnaeus (1763: 869) treated this same species but with a different circumscription, and cited the same references to its identity as previously, plus a new one, Plumier's Icones 48, tab. 58. *Bignonia crucigera* was later studied by de Candolle (1845: 152), who revised its circumscription significantly: he excluded all of the original elements (i.e., the names and figures that detailed the species) that were cited by Linnaeus, and he applied this name only to the species in Plumier's plate. Thus, de Candolle's use of the name *B. crucigera* was a misidentification, because the plants he included under this name must match at least one of Linnaeus's type elements from the original (1753) circumscription of this species in order for this name to correctly applied, but de Candolle specifically excluded those. The plants that de Candolle included in his new circumscription of the species he incorrectly called *B. crucigera* were later described and detailed by Seemann (1852–1857), who called them *Tanaecium crucigerum*. Because de Candolle misidentified these plants, the name *B. crucigera* does not apply to them so they did not have a validly published name until Seemann named them. Seemann's name was thus not based on Linnaeus's name *B. crucigera*, and is nomenclaturally separate from that. Seemann cited three elements to identify his species *T. crucigera*: Plumier's plate, some unspecified materials from Dominica collected by Imray, and some unspecified

materials from St. Vincent collected by Guilding. Seemann's collections are mainly deposited at BM, but are found widely elsewhere as well (Stafleu & Cowan, 1985: 474). The Guilding collections have not been found. Two collections of Dr. John Imray's from Dominica that were part of Hooker's herbarium are imaged on the web at K, *Imray 94* and *Imray 4* (both databased there as Imary). These are both annotated with the name *T. crucigerum* and a reference to Plumier's plate. Howard (1989: 334) lectotypified Seemann's name on the specimen *Imray 95*, but this particular collection has not been located in this study. Further work will be needed to either locate this lectotype specimen at K, or confirm that Howard incorrectly cited the type number.

Habitat and distribution. This species is found in humid forest vegetation in the Lesser Antilles (Dominica, Martinique), Colombia (Atlántico, Bolívar, César, Magdalena), Venezuela (Anzoátegui, Apure, Cojedes, Delta Amacuro, Guárico, Portuguesa), and Trinidad and Tobago.

6. Tanaecium cyrtanthum (Mart. ex DC.) Bureau & K. Schum, Fl. Bras. 8(2): 186. 1896. *Tecoma cyrtantha* Mart. ex DC., in A. DC., Prodr. 9: 218. 1845. TYPE: Brazil. Bahia: Pão d'Espinho, Oct., *C. F. P. von Martius 1860* (holotype, M-88980!, M-88980 as photo F neg. 20463 at MO-1693071; isotype, G-DC!).

Habitat and distribution. This species is found in dry forest and caatinga vegetation in Bolivia, Paraguay, Brazil (Bahia, Ceará, Pernambuco, Rio Grande do Norte), and Argentina (Salta).

7. Tanaecium duckei A. Samp., Ann. Acad. Brasil. Sci. 7: 125. 1935. *Spathicalyx duckei* (A. Samp.) A. H. Gentry, Phytologia 35(3): 194. 1977. TYPE: Brazil. Pará: Óbidos, 21 July 1918, *A. Ducke s.n.* (holotype, MG-17137; isotypes, K!, MO-2192052!, RB-22695).

Habitat and distribution. This species is found in wet forest vegetation in Colombia (Amazonas), Peru (Loreto, Pasco), and Brazil (Amazonas, Minas Gerais, Pará, Rio de Janeiro).

8. Tanaecium exitiosum Dugand, Caldasia 1(5): 31, fig. 1. 1942. TYPE: Colombia. Santander: Barrancabermeja, 50 m, 5 Apr. 1942, *R. Mora s.n.* (holotype, COL-10017 image!).

Habitat and distribution. This species is found in humid forest vegetation in northern Colombia (Antioquia, Caldas, Santander).

9. Tanaecium jaroba Sw., Prodr. 92: 1788, as "Iaroba." TYPE: Jamaica. s. loc., s.d., *O. Swartz s.n.* (holotype, S not seen).

Habitat and distribution. This species is found in swampy and flooded forest vegetation (Gentry, 1997) in the Antilles (Jamaica, St. Vincent), Honduras, Nicaragua, Costa Rica, Panama, Colombia (Amazonas, Antioquia, Atlántico, Bolívar, Caquetá, La Guajira, Magdalena, Sucre), Venezuela (Amazonas, Apure, Bolívar, Carabobo, Delta Amacuro, Guárico, Zulia), Trinidad and Tobago, Guyana, French Guiana, Ecuador, Peru (Loreto, Madre de Dios, Ucayali), Bolivia, and Brazil (Amazonas, Mato Grosso, Pará, Roraima).

10. Tanaecium mutabile (Bureau & K. Schum.) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea mutabilis* Bureau & K. Schum., Fl. Bras. 8(2): 38. 1896. *Fridericia mutabilis* (Bureau & K. Schum.) L. G. Lohmann, Monogr. Syst. Bot. Missouri Bot. Gard. 107(2): 1606. 2008, nom. nud. invalid. *Fridericia mutabilis* (Bureau & K. Schum.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 765. 2010, nom. nud. invalid. TYPE: Brazil. São Paulo: Campinas, s.d., *J. Correia de Méllo 44* (lectotype, designated here, P [barcode] P00468542!; isolectotypes, P [barcode] P00468543!, P [barcode] P00468544!, P [barcode] P00468545!, P [barcode] P00468546!, S not seen, S as photocopy at MO-2909990!).

Nomenclatural note. Two syntypes were cited in the protologue of this name, *Correia de Mello 44* and *Balansa 405*, from Paraguari near Yanguaron in Paraguay (G-DC not seen, G-DC as photo F neg. 26170 at MO-1692794!, K not seen, K as photocopy at MO-2904352!). The collection found at P is here designated as the type because it is more likely to be part of Bureau's original material of this species. Five duplicates are deposited at P, and the only flowering material is here selected as the lectotype. This species was sometimes provisionally included in *Fridericia* by Lohmann (Arbo & Lohmann, 2008; Lohmann, 2010; in sched.), but recent detailed study confirms its classification in *Tanaecium*.

Habitat and distribution. This species is found occasionally in seasonal vegetation in Bolivia, Paraguay, Brazil (Acre, Minas Gerais, Paraná, Rio Grande do Sul, Santa Catarina, São Paulo), and Argentina (Corrientes, Misiones, Salta).

11. Tanaecium neobrasiliense L. G. Lohmann, nom. nov. Replaced name: *Sanhilaria brasiliensis* Baill., Hist. Pl. 10: 27. 1888, non *Tanaecium brasiliense* Miers, 1891. *Hilariophyton brasilien-*

sis (Baill.) Pichon, Bull. Soc. Bot. France 92: 228. 1946, nom. superfl. illeg. *Paragonia brasiliensis* (Baill.) A. H. Gentry, Ann. Missouri Bot. Gard. 63(1): 70. 1976. *Tanaecium neobrasiliense* L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 771. 2010, nom. nud. invalid. TYPE: Brazil. Minas Gerais: s. loc., 1816–1821, *A. St. Hilaire 745* (holotype, P [barcode] P00468597!; isotype, P [barcode] P00468598!).

Habitat and distribution. This species is found in cerrado vegetation in eastern Brazil (Bahia, Ceará, Minas Gerais).

12. Tanaecium pyramidatum (Rich.) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 274. 2008. *Bignonia pyramidata* Rich., Actes Soc. Hist. Nat. Paris 1: 110. 1792. *Tabebuia pyramidata* (Rich.) DC., in A. DC., Prodr. 9: 214. 1845. *Paragonia pyramidata* (Rich.) Bureau, Konigl. Danske Vidensk. Selsk. Skr., Naturvidensk. Math. Afd., ser. 6, 6: 422. 1892. TYPE: French Guiana. Cayenne, s.d., *J. B. Leblond 292* (holotype, P-LA!).

Habitat and distribution. This species is found in dry to evergreen lowland to montane forest vegetation (Gentry, 1997) in Mexico (Campeche, Chiapas, Colima, Oaxaca, Quintana Roo, Tabasco, Veracruz), Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Amazonas, Antioquia, Atlántico, Boyacá, Caquetá, Chocó, Córdoba, Cundinamarca, Guaviare, Magdalena, Meta, Nariño, Putumayo, Santander, Valle del Cauca, Vaupés), Venezuela (Amazonas, Anzoátegui, Apure, Barinas, Bolívar, Delta Amacuro, Distrito Federal, Falcón, Lara, Miranda, Monagas, Portuguesa, Sucre, Yaracuy, Zulia), Trinidad and Tobago, Guyana, Suriname, French Guiana, Ecuador, Peru (Amazonas, Cusco, Huánuco, Junín, Loreto, Madre de Dios, Pasco, Puno, San Martín, Ucayali), Bolivia, Paraguay, Brazil (Acre, Amapá, Amazonas, Bahia, Ceará, Distrito Federal, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraíba, Paraná, Pernambuco, Piauí, Rio de Janeiro, Rio Grande do Sul, Rondônia, Roraima, Santa Catarina, São Paulo), and Uruguay. This is one of the most widespread and commonly collected species in this tribe.

13. Tanaecium revillae (A. H. Gentry) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea revillae* A. H. Gentry, Ann. Missouri Bot. Gard. 65(2): 726, fig. 1. 1978 [1979]. *Tanaecium revillae* (A. H. Gentry) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 771. 2010, nom. nud. invalid. TYPE: Peru. Loreto: Maynas, distr. Pebas, Río Yahuasyacu, afluente del Río Ampiyacu, 18 July 1976, *J. Revilla 718* (holotype, MO-2416649!; isotypes, COL not seen, F-1797223 image!, NY [barcode] NY00313111!, UNAP not seen, USM not seen).

Habitat and distribution. This species is found in wet and flooded lowland forest vegetation in Guyana, Suriname, Peru (Loreto), and Brazil (Amazonas, Pará).

14. Tanaecium selloi (Spreng.) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 274. 2008. *Bignonia selloi* Spreng., Syst. Veg. 2: 831. 1825. *Arrabidaea selloi* (Spreng.) Sandwith, Kew Bull. 8(4): 461. 1953 [1954]. TYPE: Brazil. s. loc., 1840, *F. Sellow s.n.* (holotype, B†; lectotype, designated here, L-898196-295 image!; isolectotype, L-898196-296 image!).

Nomenclatural note. The holotype of *Bignonia selloi* was destroyed at B, but duplicates were located at L and the best flowering material is here designated as the lectotype.

Habitat and distribution. This species is found in semideciduous and dry forest vegetation in Colombia (Bolívar), Venezuela (Falcón, Lara, Zulia), Peru (Cusco), Bolivia, Paraguay, Brazil (Bahia, Ceará, Distrito Federal, Espírito Santo, Goiás, Mato Grosso do Sul, Minas Gerais, Paraíba, Paraná, Pernambuco, Rio de Janeiro, Rio Grande do Sul, Roraima, Santa Catarina, São Paulo), and Argentina (Chaco, Corrientes, Jujuy, Misiones, Salta).

15. Tanaecium tetragonolobum (Jacq.) L. G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 274. 2008. *Bignonia tetragonoloba* Jacq., Fragm. Bot. 36, tab. 40, fig. 2. 1809 [1810]. *Ceratophytum tetragonolobum* (Jacq.) Sprague & Sandwith, Bull. Misc. Inform. Kew 1934: 222. 1934. TYPE: tab. 40, fig. 2 in N. J. Jacquin, Fragm. Bot. 36, 1809 [1810] (lectotype, designated here).

Habitat and distribution. This species is found in dry to evergreen lowland forest vegetation (Gentry, 1997) in Mexico (Campeche, Chiapas, Quintana Roo, Tabasco, Yucatán), the Antilles (Grenada), Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Atlántico, Bolívar, Chocó, La Guajira, Magdalena, Meta, Santander, Sucre), Venezuela (Anzoátegui, Aragua, Barinas, Bolívar, Carabobo, Distrito Federal, Falcón, Guárico, Lara, Mérida, Miranda, Monagas, Portuguesa, Táchira, Yaracuy, Zulia), Trinidad and Tobago, Guyana,

Suriname, Ecuador, Peru (Loreto, Madre de Dios, Pasco, San Martín, Ucayali), Bolivia, and Brazil (Pará, Rondônia).

16. **Tanaecium truncatum** (A. Samp.) L. G. Lohmann, comb. nov. Basionym: *Periarrabidaea truncata* A. Samp., Bol. Mus. Nac. Rio de Janeiro 12: 86. 1936. *Tanaecium truncatum* (A. Samp.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 771. 2010, nom. nud. invalid. TYPE: Brazil. Amazonas: Manaus, Villa Municipal, 27 July 1931, *A. Ducke s.n. in RB-24093* (holotype, R-24093!).

Habitat and distribution. This species is found in humid forest vegetation in Ecuador, Peru (Cusco, Huánuco, Loreto, Madre de Dios, Ucayali), Bolivia, and Brazil (Amazonas, Goiás, Maranhão, Mato Grosso, Pará, Rondônia).

17. **Tanaecium xanthophyllum** (DC.) L. G. Lohmann, comb. nov. Basionym: *Tabebuia xanthophylla* DC., in A. DC., Prodr. 9: 214. 1845. *Arrabidaea xanthophylla* (DC.) Bureau & K. Schum., Fl. Bras. 8(2): 70. 1896. *Xylophragma xanthophylla* (DC.) J. F. Macbr., Publ. Field Mus. Nat. Hist., Bot. Ser., 13 (pt. 5c, no. 1): 65. 1961, as "*xanthophyllum*." *Spathicalyx xanthophylla* (DC.) A. H. Gentry, Phytologia 35(3): 195. 1977. *Tanaecium xanthophyllum* (DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 771. 2010, nom. nud. invalid. TYPE: Brazil. Amazonas: Alto Amazonas, Rio Negro, Maribi, towards River Japurá, Dec. 1819, *C. F. P. von Martius 2967* (holotype, G-DC!, G-DC as photo F neg. 7686 at MO-1692866!; isotypes, M-88929!, M-88930!, M-88931!, M-88932!, M-88933!, M-88934!, M-88935!).

Habitat and distribution. This species is found in wet forest vegetation in Colombia (Amazonas, Putumayo), Ecuador, Peru (Amazonas, Cusco, Junín, Loreto, Madre de Dios, San Martín, Ucayali), Bolivia, and Brazil (Amazonas, Maranhão).

XX. Tynanthus Miers, Proc. Roy. Hort. Soc. London. 3: 193. 1863, *Tynnanthus*, orth. var. TYPE: *Tynanthus fasciculatus* (Vell.) Miers (lectotype, designated by Sandwith [1962: 454]).

Schizopsis Bureau, Monogr. Bignon. 44. 1864. TYPE: *Schizopsis labiata* (Cham.) Bureau ex Baill. [≡ *Tynanthus labiatus* (Cham.) Miers].

Lianas, without dimorphic juvenile growth, with strong clove odor; stems with 4 phloem wedges in cross-section, pith solid; branchlets cylindrical (to angled and flattened in *Tynanthus polyanthus*), pubescent, sparsely to densely lenticellate, without interpetiolar glands, with discontinuous interpetiolar ridge, with epidermis not peeling; prophylls of axillary buds foliaceous or minute and triangular, with or without glands. Leaves 2- or 3-foliolate, terminal leaflet often replaced by a trifid tendril, tendrils without adhesive disks, without uncinate apices; leaflets chartaceous, with glands sparsely distributed over lamina, without pellucid punctations, without domatia, petiolules not articulated; petiole cylindrical, never modified into a tendril, not articulated. Inflorescence axillary or terminal, a compound thyrse. Flowers zygomorphic, pentamerous; calyx cupular, truncate (5-denticulate in *T. fasciculatus*), membranaceous, puberulent to villose externally, without glands; corolla white, without nectar guides, infundibuliform, bilabiate, and short (less than 1 cm), curved in tube, membranaceous, villose externally, without glands, lobes 5 with upper 2 fused, imbricate; stamens 4, with well-developed filaments, exserted, anthers glabrous, thecae forward-curved, pollen in monads, colpate, with exine psilate; ovary sessile, smooth and villose externally, ovules in 2 series on each placenta, stigma rhombic, glabrous; disk poorly developed. Capsules linear, flattened, straight, coriaceous, with valves 2, puberulous to villose, without lenticels, without glands, with margins raised to developed into wings, smooth, with calyx caducous; seeds winged, with body smooth and glabrous, wings hyaline, linear. Figure 18D, E.

Number of species, distribution, and habitat. *Tynanthus* includes 15 species found in wet to dry forest vegetation from southern Mexico to Bolivia and southern Brazil.

Tynanthus is characterized by its strong smell of cloves (a synapomorphy of the genus), generally cylindrical branchlets (later becoming angled to flattened in *T. polyanthus*), trifid tendrils, relatively small (less than 1 cm long) bilabiate corollas with the two upper lobes fused (also a synapomorphy; Fig. 18E), a poorly developed nectar disk, and fruits with characteristic raised margins that are frequently developed into conspicuous wings (also a synapomorphy). Winged fruits are otherwise found only in *Cuspidaria* and *Fridericia*, but in those genera the wings develop from the midrib rather than the margins and the tendrils are simple. *Tynanthus* is well circumscribed, but its species limits are not clear, at least in part because most of the species are not well known.

The spelling of *Tynanthus* has sometimes been confused. At the time of its publication it was written as Tynanthus, which is the accepted spelling.

However, subsequent authors have frequently misspelled the name as Tynnanthus.

1. Tynanthus cognatus (Cham.) Miers, Proc. Roy. Hort. Soc. London 3: 193. 1863. *Bignonia cognata* Cham., Linnaea 7: 703. 1832 [1833]. TYPE: Brazil. s. loc., s.d., *F. Sellow 166* (holotype, LE not seen; isotypes, B†, G as photo F neg. 18479 at MO-1692884!, K!, K as photocopy at MO-2904325!).

Habitat and distribution. This species is found in humid forest vegetation in southeastern Brazil (Bahia, Espírito Santo, Minas Gerais, Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina, São Paulo).

2. Tynanthus croatianus A. H. Gentry, Ann. Missouri Bot. Gard. 58(1): 93, fig. 1. 1971. TYPE: Panama. Canal Zone [Panamá]: shoreline NE of Drayton House on Barro Colorado Island, 28 Aug. 1970, *T. B. Croat 11927* (holotype, MO-2039180!; isotypes, F-1697804 image!, K!, MO-2016962!, MO-2042197!, MO-2042198!, NY-328978!, US-2620246 image!).

Habitat and distribution. This species is found in lowland humid forest vegetation in Costa Rica, Panama, and Colombia (Chocó).

3. Tynanthus elegans Miers, Proc. Roy. Hort. Soc. London 3: 193. 1863. *Bignonia elegans* Cham., Linnaea 7: 702. 1832 [1833], nom. illeg., non *Bignonia elegans* Vell., 1825 [1829]. TYPE: Brazil. s. loc., s.d., *F. Sellow 5596* (holotype, LE not seen; isotype, B†, B as photo F neg. 18585 at MO-1692891!).

Nomenclatural note. The collection number of the type was not specified in the protologue, but the specimen at B that was numbered 5596 was considered a duplicate of the type by A. H. Gentry in sched. and his annotation is provisionally followed here. An ongoing taxonomic revision of the genus will further clarify its typification (Medeiros & Lohmann, in prep.).

Habitat and distribution. This species is found in humid forest vegetation in southeastern Brazil (Espírito Santo, Minas Gerais, Paraná, Rio de Janeiro, Santa Catarina, São Paulo).

4. Tynanthus fasciculatus (Vell.) Miers, Proc. Roy. Hort. Soc. London 3: 193. 1863. *Bignonia fasciculata* Vell., Fl. Flumin. 247. 1825 [1829]; Fl. Flumin. Icon. 6: tab. 25. 1827 [1831]. *Arrabidaea fasciculata* (Vell.) DC., in A. DC., Prodr. 9: 185. 1845. *Cuspidaria fasciculata* (Vell.) Sond., Linnaea 22: 560. 1849. TYPE: tab. 25 in Vellozo, Fl. Flumin. Icon. 6, 1827 [1831] (lectotype, designated here).

Habitat and distribution. This species is found in humid forest vegetation in southeastern Brazil (Minas Gerais, São Paulo).

5. Tynanthus goudotianus (Bureau) Bureau, Adansonia 8: 274. 1868, as "*goudotiana*." *Tynanthus gondotiana*, orth. var. *Schizopsis goudotiana* Bureau, Adansonia 5: 374. 1865. *Schizopsis gondotiana*, orth. var. TYPE: Nouvelle-Granade [Colombia]. s. loc., May–June 1844, *J. Goudot s.n.* (holotype, P!, P as photocopy at MO-2909992!, P as photo F neg. 39957 at K!).

Habitat and distribution. This species is found in humid forest vegetation in Colombia (Amazonas, Caquetá) and Brazil (Amazonas).

6. Tynanthus guatemalensis Donn. Sm., Bot. Gaz. 18(1): 6. 1893. TYPE: Guatemala. Quezaltenango: Río Ocosito, 250 ft., Apr. 1892, *J. Donnell Smith 1488* (holotype, US-1322405 image!; isotypes, GH not seen, M!, NY [barcode] NY00328979!, P [barcode] P00468599!, US-48056 image!).

Habitat and distribution. This species is found in humid forest vegetation in Mexico (Campeche, Chiapas, Oaxaca, Quintana Roo, Tabasco, Veracruz), in Belize and Guatemala.

7. Tynanthus labiatus (Cham.) Miers, Proc. Roy. Hort. Soc. London 3: 193. 1863. *Bignonia labiata* Cham., Linnaea 7: 701. 1832 [1833]. *Schizopsis labiata* (Cham.) Bureau ex Baill., Adansonia 5: 373. 1864 [1865]. TYPE: Brazil. s. loc., s.d., *F. Sellow s.n.* (holotype, LE not seen; isotypes, B†, G-DC!, K!, K as photocopy at MO-2904326!, NY [barcode] NY00579087!).

Habitat and distribution. This species is found in Atlantic forest vegetation in southeastern Brazil (Bahia, Espírito Santo, Minas Gerais, Rio de Janeiro, Rio Grande do Sul, Santa Catarina, São Paulo).

8. Tynanthus macranthus L. O. Williams, Fieldiana, Bot. 31(10): 250. 1967. TYPE: Costa Rica. Heredia: 8 km S of San Miguel, 800 m, 9 July 1964, *R. W. Lent 42* (holotype, F-1622130 image!; isotypes, NY [barcode] NY00328981! OKL not seen, US-2964011 image!).

Habitat and distribution. This species is found in cloud forest vegetation in the Cordillera de Talamanca of Costa Rica and western Panama.

9. Tynanthus micranthus Corr. Méllo ex K. Schum, Nat. Pflanzenfam. 4(3b): 221. 1894, as "micrantha." TYPE: Brazil. São Paulo: Campinas, 9 Mar. 1867, *J. Correia de Méllo 26* (lectotype, designated here, P [barcode] P00481491!; isolectotypes, K [barcode] K000449546!, P [barcode] P00481488!, P [barcode] P00481489!, P [barcode] P00481490!, P [barcode] P00481481 not seen, P [barcode] P00481481 as photocopy at MO-2692713!, US-2515396 image!).

Nomenclatural note. Even though the original description of *Tynanthus micranthus* does not mention a type specimen, it does cite Correia de Mello as the source of the name. In a contemporaneous treatment Bureau and Schumann (1896) listed two specimens, one of which is a collection by Correia de Mello and here presumed to represent the type. The type is presumably at P, where Bureau worked, and where there are several duplicates of this collection; the best flowering specimen at P is here chosen as the lectotype. A duplicate of this collection may have been deposited at B also, but if so it has been destroyed and no such specimen is documented by the F type photos.

Habitat and distribution. This species is found in humid forest vegetation in Paraguay, Brazil (Mato Grosso do Sul, Paraná, São Paulo), and Argentina (Misiones).

10. Tynanthus panurensis (Bureau) Sandwith, Kew Bull. 8(4): 465. 1953 [1954]. *Schizopsis panurensis* Bureau, Adansonia 5: 373. 1865. TYPE: Brazil. Amazonas: near Panuré at Rio Uaupés, Oct. 1852–Jan. 1853, *R. Spruce 2626* (holotype, P [barcode] P00468600!; isotype, BM!, BM as photocopy at MO-2300302!).

Habitat and distribution. This species is found in humid forest vegetation in Colombia (Amazonas, Caquetá, Putumayo), Ecuador, Peru (Amazonas, Loreto, Pasco, San Martín), Bolivia, and Brazil (Amazonas).

11. Tynanthus polyanthus (Bureau) Sandwith, Kew Bull. 8(4): 465. 1953 [1954]. *Schizopsis polyantha* Bureau, Adansonia 5: 378. 1865. TYPE: Peru. San Martín: Tarapoto, 1855–1856, *R. Spruce 4895* (lectotype, designated here, P [barcode] P00481492!; isolectotypes, C not seen, C as photo F neg. 22126 at MO-1693114!, F-875569 image!, K [barcode] K000202056!, K [barcode] K000202057!, K [barcode] K000202058!, K [barcode] K000202059!, NY [barcode] NY00328924!, P [barcode] P00481493!, P [barcode] P00481494!).

Nomenclatural note. Original material of the type collection is deposited at P, where Bureau worked. Three duplicates are deposited there, and the best material is here selected as the lectotype.

Habitat and distribution. This species is found in humid forest vegetation in the Greater Antilles (Dominican Republic, Puerto Rico), Colombia (Antioquia, Chocó, Meta), Venezuela (Amazonas), Guyana, Ecuador, Peru (Amazonas, Cusco, Huánuco, Loreto, Madre de Dios, Pasco, Puno, San Martín, Ucayali), Bolivia, and Brazil (Acre, Amazonas, Pará).

12. Tynanthus pubescens A. H. Gentry, Mem. New York Bot. Gard. 29(1): 275, fig. 124C. 1978. TYPE: Guyana. Upper Mazaruni River Basin, Kamarang River, Singh line from Akapai to Eboropu escarpment, 500 m, 13 Oct. 1960, *S. S. Tillett & C. L. Tillett* 45643 (holotype, MO-2242100!; isotypes, K!, NY [barcode] NY00328985!, US-2819584 image!).

Habitat and distribution. This species is found in humid forest vegetation in Venezuela (Amazonas), Guyana, Suriname, French Guiana, Peru (San Martín), and Brazil (Pará, Rondônia).

13. Tynanthus sastrei A. H. Gentry, Phytologia 46(4): 214. 1980. TYPE: French Guiana. Sinnamary, on way to Ste. Elie, 23 Sep. 1977, *C. Sastre 6015* (holotype, MO-2630185!; isotypes, P [barcode] P00481495!, P [barcode] P00481496!).

Habitat and distribution. This species is found in humid forest vegetation in Suriname and French Guiana.

14. Tynanthus schumannianus (Kuntze) A. H. Gentry, Ann. Missouri Bot. Gard. 61(3): 874. 1974. *Cuspidaria schumanniana* Kuntze, Revis. Gen. Pl. 3(3): 243. 1893. TYPE: Bolivia. Yacapari, June 1892, *C. E. O. Kuntze s.n.* (holotype, NY [barcode] NY00328766!).

Habitat and distribution. This species is found in humid forest vegetation in Ecuador, Peru (Cusco, Madre de Dios, Puno), Bolivia, and Brazil (Acre, Amazonas, Pará, Rondônia).

15. Tynanthus villosus A. H. Gentry, Ann. Missouri Bot. Gard. 63(1): 60, fig. 5. 1976, as "*Tynnathus*." TYPE: Peru. San Martín: Mariscal Cáceres, Tocache Nuevo, Quebrada de Cañuto,

400 m, 18 Aug. 1973, *J. Schunke Vigo 6852* (holotype, MO-2175155!; isotypes, F-1763392 image!, K!, RB-185816 [barcode] 536855!, RB-185816 [barcode] 536925!).

Habitat and distribution. This species is found in humid forest vegetation in Peru (Huánuco, San Martín, Ucayali), Bolivia, and Brazil (Acre).

XXI. Xylophragma Sprague, Hooker's Icon. Pl. 28, tab. 2770. 1905. TYPE: *Xylophragma pratense* (Bureau & K. Schum.) Sprague (lectotype, designated by Gentry [1973b: 997]).

Orthotheca Pichon, Bull. Soc. Bot. France 92: 226. 1946, nom illeg., non *Orthotheca* Brid. (1826). *Heterocalycium* Rauschert, Taxon 31: 558. 1982, replacement name. TYPE: *Heterocalycium heterocalyx* (Bureau & K. Schum.) Raeuschert [≡ *Xylophragma heterocalyx* (Bureau & K. Schum.) A. H. Gentry].

Rojasiophyton Hassl., Repert. Spec. Nov. Regni Veg. 9: 53 1910. TYPE: *Rojasiophyton tuberculatum* Hassl. [= *Xylophragma pratense* (Bureau & K. Schum.) Sprague].

Shrubs, without dimorphic juvenile growth, without strong odor; stems with 4 phloem wedges in cross-section, pith solid; branchlets cylindrical, pubescent, with sparse lenticels, with interpetiolar glands, with discontinuous interpetiolar ridge, with epidermis not peeling; prophylls of axillary buds minute or bromeliad-like, without glands. Leaves (1-) 2- to 3-(5-)foliolate, terminal leaflet often replaced by a simple tendril, tendrils without adhesive disks, without uncinate apices; leaflets with glands sparsely distributed over lamina, without pellucid punctations, with domatia, petiolules not articulated; petiole cylindrical, never modified into a tendril, not articulated. Inflorescence terminal and/or axillary, a compound thyrse. Flowers zygomorphic, pentamerous; calyx cupular, shortly 5-lobed or truncate, coriaceous, villose externally, with glands clustered near margins; corolla pink or magenta, without nectar guides, infundibuliform, straight in tube, membranaceous, villose externally, without glands, lobes 5, imbricate; stamens 4, with well-developed filaments, included, anthers glabrous, thecae straight, pollen in monads, colpate, with exine psilate; ovary sessile, smooth and lepidote externally, ovules in multiple series on each placenta, stigma rhombic, glabrous; disk annular. Capsules linear, flattened, straight, coriaceous or woody, with valves 2, glabrous or puberulous, with or without lenticels, with or without glands, without wings, smooth, with calyx caducous; seeds winged, with body rough and glabrous, wings hyaline or opaque, linear.

Number of species, distribution, and habitat. *Xylophragma* includes seven species found in wet to dry forest, caatinga, and cerrado vegetation from Mexico to Paraguay and southeastern Brazil.

Xylophragma is characterized by the combination of the bromeliad-like prophylls of the axillary buds, 1- to 5-foliolate leaves, simple tendrils, interpetiolar glands, ovules arranged in multiple series on each placenta, and seeds with a rough body (this last character is a synapomorphy of the genus). *Xylophragma* is very similar to *Fridericia* and *Cuspidaria*, which can be separated reliably only by the arrangement of the ovules: in a single series on each placenta in *Fridericia*, and in two series in *Cuspidaria*.

1. Xylophragma harleyi (A. H. Gentry ex M. M. Silva & L. P. Queiroz) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea harleyi* A. H. Gentry ex M. M. Silva & L. P. Queiroz, Sitientibus, Ciênc. Biol. 1: 47. 2001. *Xylophragma harleyi* (A. H. Gentry ex M. M. Silva & L. P. Quieroz) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 772. 2010, nom. nud. invalid. TYPE: Brazil. Bahia: Serra do Curral Feio, 3 km NW of Lagoinha (5.5 km SW of Delfino) on side rd. to Minas do Mimoso, 640 m, 10°27′S, 41°16′W, 5 Mar. 1974, *R. M. Harley, S. A. Renvoize, C. M. Erskine, C. A. Brighton & R. Pinheiro 16736* (holotype, K!; isotypes, MO-2242920!, NY [barcode] NY00313095!, P [barcode] P00468567!).

Habitat and distribution. This species is found in dry caatinga vegetation in eastern Brazil (Bahia, Ceará, Espírito Santo, Minas Gerais, Piauí).

2. Xylophragma heterocalyx (Bureau & K. Schum.) A. H. Gentry, Ann. Missouri Bot. Gard. 66(4): 778. 1979 [1980]. *Saldanhaea heterocalyx* Bureau & K. Schum., Fl. Bras. 8(2): 254. 1896 [1897]. *Orthotheca heterocalyx* (Bureau & K. Schum) Pichon, Bull. Soc. Bot. France 92: 226. 1946. *Heterocalycium heterocalyx* (Bureau & K. Schum.) Rauschert, Taxon 31: 558. 1982. TYPE: Brazil. Rio de Janeiro, 1882, *A. Glaziou 14109* (lectotype, designated here, P [barcode] P00481559!, P [barcode] P00481559 as photocopy at MO-2909930!; isolectotypes, C not seen, C as photo F neg. 22116 at MO-1693050!, K [no #]!, K [no #] as photocopy at MO-2904323!, P [barcode] P00481560!, P [barcode] P00481560 as photocopy at MO-2909930!).

Nomenclatural note. Gentry annotated the two P specimens as the lectotype and isolectotype, respec-

tively, but did not publish this selection. The lectotype is designated here following his annotations.

Habitat and distribution. This species is found in cerrado vegetation in eastern Brazil (Bahia, Espírito Santo, Minas Gerais, Rio de Janeiro).

3. Xylophragma myrianthum (Cham.) Sprague, Hooker's Icon. Pl. 28: tab. 2770. 1905. *Bignonia myriantha* Cham., Linnaea 7: 684. 1832 [1833]. *Saldanhaea myriantha* (Cham.) Bureau, Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 1893: 104. 1893 [1894]. TYPE: Brazil. s. loc., 1840, *F. Sellow s.n.* (holotype, LE not seen; isotypes, B†, G-DC!, K!).

Habitat and distribution. This species is found in cerrado vegetation in eastern Brazil (Ceará, Distrito Federal, Espírito Santo, Goiás, Maranhão, Minas Gerais, Paraná, Piauí, Rio de Janeiro, São Paulo, Tocantins).

4. Xylophragma platyphyllum (DC.) L. G. Lohmann, comb. nov. Basionym: *Arrabidaea platyphylla* DC., in A. DC., Prodr. 9: 186. 1845. *Petastoma platyphyllum* (DC.) Miers, Proc. Roy. Hort. Soc. London 3: 195. 1863. *Xylophragma platyphyllum* (DC.) L. G. Lohmann, Cat. Pl. Fung. Brasil 1: 772. 2010, nom. nud. invalid. TYPE: Brazil. Mato Grosso: Cuiabá, 1832, *A. S. Manso s.n.* (holotype, G-DC!).

Habitat and distribution. This species is found in humid forest vegetation in Peru (Huánuco, Madre de Dios, Ucayali), Bolivia, and Brazil (Acre, Amazonas, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Pará, Rondônia).

5. Xylophragma pratense (Bureau & K. Schum.) Sprague, Hooker's Icon. Pl. 28: tab. 2770. 1903. *Tecoma pratensis* Bureau & K. Schum., Nat. Pflazenfam. 4(3b): 238. 1894, nom. nud. invalid. *Saldanhaea pratensis* Bureau & K. Schum., Fl. Bras. 8(2): 256. 1896 [1897]. TYPE: Peru. San Martín: Tarapoto, 1855–1856, *R. Spruce 4232* (lectotype, designated here, K [barcode] K000449744!; isolectotypes, K [barcode] K000449743!, W!).

Nomenclatural note. The name *Tecoma pratensis* was listed by Schumann (1894) in a key that serves as the diagnosis for most of the species that are first described there. However, *T. pratensis* was keyed there together with another species, *T. amazonica* Bureau & K. Schum., and these two species were not distinguished from each other further. Thus, these two names both lack an individual diagnosis and are not validly published. The name *T. pratensis* was later referenced in the description of *Saldanhaea pratensis* Bureau & K. Schum., connecting the identity of these plants but not publishing a combination in *Saldanhaea* (as some authors have supposed) because the name intended as the basionym was never validly published. Two syntypes were cited in the protologue of *S. pratensis*, *Spruce 4232* and *Poeppig 2316* (W not seen, W as photo F neg. 52875 at MO-1693053!). The more widely distributed collection is here chosen as the type, and the best quality flowering specimen, deposited at P where Bureau worked, is designated as the lectotype.

Habitat and distribution. This species is found in humid forest vegetation in Colombia (Amazonas), Peru (Cusco, Huánuco, Junín, Loreto, Madre de Dios, Pasco, San Martín, Ucayali), Bolivia, Paraguay, and Brazil (Acre, Amazonas, Distrito Federal, Goiás, Maranhão, Mato Grosso do Sul, Pará).

6. Xylophragma seemannianum (Kuntze) Sandwith, Kew Bull. 8(4): 469. 1953 [1954]. *Saldanhaea seemanniana* Kuntze, Rev. Gen. Pl. 2: 480. 1891, as "*Soldanhaea Seemanniana*." TYPE: Trinidad, Apr. 1975, *C. E. O. Kuntze 744* (lectotype, designated by Gentry [1982: 209], NY [barcode] NY00328923 image!).

Nomenclatural note. The protologue of this name documented it with several elements: a citation of the locality "Trinidad" without a particular specimen noted; a citation of the plants from Gorgona, Colombia, and perhaps also those from Panama that Seemann (1852–1857) incorrectly identified as *Bignonia dentata* A. DC. [a synonym of *Stizophyllum perforatum* (Cham.) Miers]; the specimens *Seemann 179* and *Seemann 603*, without mention of where they were collected or deposited; and the specimen *Jürgensen s.n.* from Colombia at K. A specimen at NY from Trinidad collected by Kuntze appears to represent part of the original material, and was designated by Gentry (1982) as the lectotype.

Habitat and distribution. This species is found in semideciduous to deciduous lowland forest vegetation (Gentry, 1997) in Mexico (Campeche, Chiapas, Colima, Jalisco, Michoacán, Oaxaca, Tabasco, Veracruz), Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia (Antioquia, Bolívar, Boyacá, César, Chocó, Cundinamarca, Magdalena, Meta, Vichada), Venezuela (Amazonas), Trinidad and Tobago, Bolivia, Guyana, Suriname, Peru (Madre de Dios), and northern Brazil (Roraima).

7. Xylophragma unifoliolatum J. F. Morales & Q. Jiménez, Caldasia 31(2): 247. 2009. TYPE: Costa Rica. Guanacaste: Parque Nacional Guanacaste, Cerro El Hacha, camino a Santa Cecilia, 300–600 m, 23 Mar. 1992, *R. Espinoza 250* (holotype, INB not seen; isotypes, CR not seen, MO-5096617 image!).

Habitat and distribution. This species is found in dry forest vegetation in northwestern Costa Rica.

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Appendix 1. List of names lectotypified and neotypified here.

Genus Names with Lectotypes

Periarrabidaea A. Samp.

Species Names with Lectotypes (Only Basionyms Listed)

Adenocalymma bracteolatum DC.
Adenocalymma bullatum Bureau ex K. Schum.
Adenocalymma flavum Mart. ex DC.
Adenocalymma heterophyllum Kraenzl.
Adenocalymma inundatum Mart. ex DC.
Adenocalymma magnificum Mart. ex DC.
Adenocalymma nervosum Bureau & K. Schum.
Adenocalymma paulistarum Bureau ex K. Schum.
Adenocalymma scabriusculum Mart. ex DC.
Adenocalymma uleanum Kraenzl.
Amphilophium pubescens Spreng.
Anemopaegma album Mart. ex DC.
Anemopaegma citrinum Mart. ex DC.
Anemopaegma glaucum Mart. ex DC.
Anemopaegma goyazense K. Schum.
Anemopaegma jucundum Bureau & K. Schum.
Anemopagema paraense Bureau & K. Schum.
Anemopaegma parkeri Sprague
Anemopaegma velutinum Mart. ex DC.
Arrabidaea celastroides Bureau ex K. Schum.
Arrabidaea cinerea Bureau & K. Schum.
Arrabidaea claussenii A. DC.
Arrabidaea dispar Bureau ex K. Schum.
Arrabidaea egensis Bureau & K. Schum.
Arrabidaea florida DC.
Arrabidaea lauta Bureau & K. Schum.
Arrabidaea mutabilis Bureau & K. Schum.
Arrabidaea nicotianiflora Kraenzl.
Arrabidaea subexserta Bureau & K. Schum.
Bignonia arvensis Vell.
Bignonia chamberlaynii Sims
Bignonia conjugata Vell.
Bignonia convoluta Vell.
Bignonia cordata Vell.
Bignonia elegans Vell.
Bignonia erubescens DC.
Bignonia fasciculata Vell.
Bignonia flavida DC.
Bignonia fluminensis Vell.
Bignonia grandifolia Jacq.
Bignonia impressa Rusby
Bignonia latifolia Rich.
Bignonia longa Vell.
Bignonia longiflora Cav.
Bignonia pedunculata Vell.
Bignonia perianthomega Vell.
Bignonia quadrivalvis Jacq.
Bignonia rego Vell.
Bignonia scandens Vell.
Bignonia selloi Spreng.
Bignonia ternata Vell.
Bignonia tetragonoloba Jacq.
Bignonia unguiculata Vell.
Clytostoma convolvuloides Bureau & K. Schum.
Clytostoma costatum Bureau & K. Schum.
Clytostoma pterocalyx Sprague ex Urb.
Cremastus lachnaeus Bureau
Cuspidaria multiflora DC.
Distictis crassa Bureau & K. Schum.
Fridericia speciosa Mart.
Glaziova bauhinioides Bureau ex Baill.
Lundia densiflora DC.
Lundia obliqua Sond.
Lundia virginalis DC.
Macfadyena dentata K. Schum.
Mansoa glaziovii Bureau & K. Schum.
Memora axillaris K. Schum.
Paramansoa grosourdyana Baill.
Petastoma formosum Bureau
Pithecoctenium parviflorum Mart. ex DC.
Pleonotoma stichadenia K. Schum.
Pseudopaegma colombianum Sandwith
Saldanhaea costaricensis Kraenzl.
Saldanhaea heterocalyx Bureau & K. Schum.
Saldanhaea pratensis Bureau & K. Schum.
Schizopsis polyantha Bureau
Setilobus bracteatus Baill. ex Bureau & K. Schum.
Tecoma lateriflora Mart.
Tynanthus micranthus Corr. Méllo ex K. Schum.

Species Name with Neotypes (Only Basionym Listed)

Memora campicola Pilg.

Appendix 2. Index to names treated in this classification.

Plant names in boldface are **accepted** species of Bignoniaceae tribe Bignonieae, according to the taxonomic treatment here. Names in italics are *synonyms*, with the accepted name

indicated by "=". The names included in this appendix all correspond to the tribe Bignonieae and to names treated in this article. These names include all accepted genera, all generic synonyms and their type species, all accepted names in the manuscript, and the homotypic names that correspond to the accepted names as follows. For the homotypic names of accepted names, all validly published names are included, with selected significant orthographic variants and selected significant invalid names. The index does not list all the invalid names mentioned in the article, only the ones that have generated confusion. The status of the individual names (for example, invalid or illegitimate) is not marked here; see the taxonomic treatment for information about this. Names lectotypified or neotypified here are indicated by double asterisks (**). Genera listed here in brackets are not included in the tribe Bignonieae, but are mentioned in this list because some species of Bignonieae were (erroneously) classified in those genera. Additional synonymous names for Bignonieae can be found at <http://www.iplants.org> and <http://www.TROPICOS.org>.

Adenocalymma Mart. ex Meisn.
Adenocalymma adnophorum (Sandwith) L. G. Lohmann
Adenocalymma album (Aubl.) L. G. Lohmann
Adenocalymma allamandiflorum (Bureau ex K. Schum.) L. G. Lohmann
Adenocalymma alliaceum (Lam.) Miers, = **Mansoa alliacea** (Lam.) A. H. Gentry
Adenocalymma apparicianum J. C. Gomes
Adenocalymma apurense (Kunth) Sandwith
Adenocalymma arthropetiolatum A. H. Gentry
Adenocalymma aspericarpum (A. H. Gentry) L. G. Lohmann
Adenocalymma axillare (K. Schum.) L. G. Lohmann
Adenocalymma bilabiatum (Sprague) Sandwith, = **Tanaecium bilabiatum** (Sprague) L. G. Lohmann
Adenocalymma bipinnatum (S. Moore) L. G. Lohmann
Adenocalymma biternatum (A. Samp.) L. G. Lohmann
Adenocalymma bracteatum (Cham.) DC.
Adenocalymma bracteolatum DC.**
Adenocalymma bracteosum (DC.) L. G. Lohmann
Adenocalymma bullatum Bureau ex K. Schum.**
Adenocalymma calcareum Udulutsch & P. Dias
Adenocalymma campicola (Pilg.) L. G. Lohmann
Adenocalymma chocoense A. H. Gentry
Adenocalymma cidii (A. H. Gentry ex Hauk) L. G. Lohmann
Adenocalymma cladotrichum (Sandwith) L. G. Lohmann
Adenocalymma comosum (Cham.) DC.
Adenocalymma contractum (A. H. Gentry ex Hauk) L. G. Lohmann
Adenocalymma coriaceum A. DC.
Adenocalymma cristacalyx (A. H. Gentry) L. G. Lohmann
Adenocalymma croatii (A. H. Gentry) L. G. Lohmann
Adenocalymma cymbalum (Cham.) Bureau & K. Schum.
Adenocalymma dichilum A. H. Gentry
Adenocalymma divaricatum Miers
Adenocalymma dugandii Sandwith
Adenocalymma dusenii Kraenzl.
Adenocalymma elegans (Vell.) Mart. ex K. Schum., = **Fridericia elegans** (Vell.) L. G. Lohmann
Adenocalymma flavidum (DC.) L. G. Lohmann, = **Adenocalymma validum** (K. Schum.) L. G. Lohmann
Adenocalymma flavidum Miers, identity unclear
Adenocalymma flaviflorum (Miq.) L. G. Lohmann
Adenocalymma flavum Mart. ex DC.**
Adenocalymma floribundum DC., = **Cuspidaria floribunda** (DC.) A. H. Gentry
Adenocalymma fruticosum A. H. Gentry
Adenocalymma gracielzae A. H. Gentry
Adenocalymma grandifolium Mart. ex DC.
Adenocalymma hatschbachii A. H. Gentry
Adenocalymma heterophyllum Kraenzl.**
Adenocalymma hirtum (Mart. ex DC.) Bureau & K. Schum.
Adenocalymma hypostictum Bureau & K. Schum.
Adenocalymma imperatoris-maximilianii (Wawra) L. G. Lohmann
Adenocalymma impressum (Rusby) Sandwith
Adenocalymma inundatum Mart. ex DC.**
Adenocalymma involucratum (Bureau & K. Schum.) L. G. Lohmann
Adenocalymma juliae (A. H. Gentry) L. G. Lohmann
Adenocalymma kerere (Aubl.) Bureau & K. Schum., = **Pachyptera kerere** (Aubl.) Sandwith
Adenocalymma longilineum (A. Samp.) L. G. Lohmann
Adenocalymma madgalenense Dugand
Adenocalymma magnificum Mart. ex DC.**
Adenocalymma magnoalatum Scud.
Adenocalymma marginatum (Cham.) DC.
Adenocalymma molle (A. H. Gentry) L. G. Lohmann
Adenocalymma moringifolium (DC.) L. G. Lohmann
Adenocalymma neoflavidum L. G. Lohmann, = **Adenocalymma validum** (K. Schum.) L. G. Lohmann
Adenocalymma nervosum Bureau & K. Schum.**
Adenocalymma nodosum (Silva Manso) L. G. Lohmann
Adenocalymma patulum (Miers) L. G. Lohmann
Adenocalymma paucifoliolatum (A. H. Gentry) L. G. Lohmann
Adenocalymma paulistarum Bureau ex K. Schum.**
Adenocalymma pedunculatum (Vell.) L. G. Lohmann
Adenocalymma peregrinum (Miers) L. G. Lohmann
Adenocalymma pliciflorum Mart. ex DC., = **Fridericia pliciflora** (Mart. ex DC.) L. G. Lohmann
Adenocalymma prancei A. H. Gentry
Adenocalymma prasinum Miers, = **Adenocalyma grandifolium** Mart. ex DC.
Adenocalymma pseudopatulum (A. H. Gentry) L. G. Lohmann
Adenocalymma pubescens (Spreng.) L. G. Lohmann
Adenocalymma purpurascens Rusby
Adenocalymma racemosum (A. H. Gentry) L. G. Lohmann
Adenocalymma reticulatum Bureau ex K. Schum.
Adenocalymma salmoneum J. C. Gomes
Adenocalymma salzmannii DC.
Adenocalymma sastrei (A. H. Gentry ex Hauk) L. G. Lohmann
Adenocalymma saulense A. H. Gentry
Adenocalymma scabriusculum Mart. ex DC.**
Adenocalymma scansile Miers
Adenocalymma schomburgkii (DC.) L. G. Lohmann
Adenocalymma sousae A. H. Gentry
Adenocalymma subincaum Huber
Adenocalymma subsessilifolium DC.
Adenocalymma subspicatum A. H. Gentry
Adenocalymma tanaeciicarpum (A. H. Gentry) L. G. Lohmann
Adenocalymma ternatum (Vell.) Corr. Méllo ex Bureau & K. Schum.
Adenocalymma trichocladum (DC.) L. G. Lohmann
Adenocalymma trifoliatum (Vell.) R. C. Laroche
Adenocalymma ubatubense Assis & Semir
Adenocalymma uleanum Kraenzl.**
Adenocalymma validum (K. Schum.) L. G. Lohmann
Adenocalymma velutinum (A. H. Gentry ex Hauk) L. G. Lohmann
Adenocalymma verruciferum (Schltdl.) Miers, = **Mansoa verrucifera** (Schltdl.) A. H. Gentry

Adenocalymma verrucosum Standl., = **Fridericia schumanniana** (Loes.) L. G. Lohmann
Alsocydia DC. ex J. C. Gomes, = **Fridericia** Mart.
Alsocydia erubescens (DC.) J. C. Gomes, = **Fridericia erubescens** (DC.) L. G. Lohmann
Amphilophium Kunth
Amphilophium arenarium (A. H. Gentry) L. G. Lohmann
Amphilophium aschersonii Ule
Amphilophium bauhinioides (Bureau ex Baill.) L. G. Lohmann
Amphilophium blanchetii (DC.) Bureau & K. Schum.
Amphilophium bracteatum (Cham.) L. G. Lohmann
Amphilophium buccinatorium (DC.) L. G. Lohmann
Amphilophium campinae (A. Samp.) L. G. Lohmann
Amphilophium carolinae (Lindl.) L. G. Lohmann
Amphilophium chocoense (A. H. Gentry) L. G. Lohmann
Amphilophium cremersii (A. H. Gentry) L. G. Lohmann
Amphilophium crucigerum (L.) L. G. Lohmann
Amphilophium cuneifolium (DC.) L. G. Lohmann
Amphilophium cynanchoides (DC.) L. G. Lohmann, = **Amphilophium carolinae** (Lindl.) L. G. Lohmann
Amphilophium dasytrichum (Sandwith) L. G. Lohmann
Amphilophium dolichoides (Cham.) L. G. Lohmann
Amphilophium dusenianum (Kraenzl.) L. G. Lohmann
Amphilophium ecuadorense A. H. Gentry
Amphilophium elongatum (Vahl) L. G. Lohmann
Amphilophium falcatum (Vell.) L. G. Lohmann
Amphilophium frutescens (DC.) L. G. Lohmann
Amphilophium glaziovii Bureau ex K. Schum.
Amphilophium gnaphalanthum (A. Rich.) L. G. Lohmann
Amphilophium granulosum (Bureau & K. Schum.) L. G. Lohmann
Amphilophium lactiflorum (Vahl) L. G. Lohmann
Amphilophium laeve (Sandwith) L. G. Lohmann
Amphilophium laxiflorum (DC.) L. G. Lohmann
Amphilophium lohmanniae (A. Pool) L. G. Lohmann
Amphilophium magnoliifolium (Kunth) L. G. Lohmann
Amphilophium mansoanum (DC.) L. G. Lohmann
Amphilophium monophyllum (Sandwith) L. G. Lohmann
Amphilophium neoglaziovii L. G. Lohmann, = **Amphilophium dusenianum** (Kraenzl.) L. G. Lohmann
Amphilophium nunezii (A. H. Gentry) L. G. Lohmann
Amphilophium obovatum (Sandwith) L. G. Lohmann
Amphilophium occidentale (A. H. Gentry) L. G. Lohmann
Amphilophium paniculatum (L.) Kunth
Amphilophium pannosum (DC.) Bureau & K. Schum.
Amphilophium parkeri (DC.) L. G. Lohmann
Amphilophium pauciflorum (A. H. Gentry) L. G. Lohmann
Amphilophium perbracteaum A. H. Gentry
Amphilophium pilosum Standl.
Amphilophium porphyrotrichum (Sandwith) L. G. Lohmann
Amphilophium pubescens Spreng.**, = **Adenocalymma pubescens** (Spreng.) L. G. Lohmann
Amphilophium pulverulentum (Sandwith) L. G. Lohmann
Amphilophium racemosum (Bureau & K. Schum.) L. G. Lohmann
Amphilophium reticulatum (A. H. Gentry) L. G. Lohmann
Amphilophium rodriguesii (A. H. Gentry) L. G. Lohmann
Amphilophium sandwithii Fabris
Amphilophium scabriusculum (Mart. ex DC.) L. G. Lohmann
Amphilophium stamineum (Lam.) L. G. Lohmann
Amphilophium steyermarkii (A. H. Gentry) L. G. Lohmann
Anemopaegma Mart. ex Meisn.
Anemopaegma acutifolium DC.
Anemopaegma alatum A. H. Gentry
Anemopaegma album Mart. ex DC.**
Anemopaegma arvense (Vell.) Stellfeld ex J. F. Souza
Anemopaegma brevipes S. Moore
Anemopaegma chamberlaynii (Sims) Bureau & K. Schum.
Anemopaegma chrysanthum Dugand
Anemopaegma chrysoleucum (Kunth) Sandwith
Anemopaegma citrinum Mart. ex DC.**
Anemopaegma colombianum (Sandwith) A. H. Gentry
Anemopaegma decorum S. Moore, = **Bignonia decora** (S. Moore) L. G. Lohmann
Anemopaegma flavum Morong
Anemopaegma floridum Mart. ex DC.
Anemopaegma foetidum Bureau & K. Schum.
Anemopaegma glaucum Mart. ex DC.**
Anemopaegma goyazense K. Schum.**
Anemopaegma gracile Bureau & K. Schum.
Anemopaegma grandifolium (Jacq.) Merr. & Sandwith
Anemopaegma granvillei A. H. Gentry
Anemopaegma heringeri J. C. Gomes
Anemopaegma hilarianum Bureau & K. Schum.
Anemopaegma insculptum (Sandwith) A. H. Gentry
Anemopaegma ionanthum A. H. Gentry
Anemopaegma jucundum Bureau & K. Schum.**
Anemopaegma karstenii Bureau & K. Schum.
Anemopaegma laeve DC.
Anemopaegma lanceolatum (DC.) Bureau ex K. Schum., = **Mansoa lanceolata** (DC.) A. H. Gentry
Anemopaegma longidens Mart. ex DC.
Anemopaegma longipetiolatum Sprague
Anemopaegma microcalyx (G. Mey.) Bureau & K. Schum., = **Bignonia microcalyx** G. Mey.
Anemopaegma mirandum (Cham.) Mart. ex DC., = **Anemopaegma arvense** (Vell.) Stellfeld ex J. F. Souza
Anemopaegma mirabile (Sandwith) A. H. Gentry
Anemopaegma oligoneuron (Sprague & Sandwith) A. H. Gentry
Anemopaegma orbiculatum (Jacq.) DC.
Anemopaegma pabstii A. H. Gentry
Anemopaegma pachyphyllum Bureau & K. Schum.
Anemopaegma paraense Bureau & K. Schum.**
Anemopaegma parkeri Sprague**
Anemopaegma patelliforme A. H. Gentry
Anemopaegma poeppigii DC., = **Fridericia poeppigii** (DC.) L. G. Lohmann
Anemopaegma prostratum DC.
Anemopaegma puberulum (Seibert) Miranda
Anemopaegma robustum Bureau & K. Schum.
Anemopaegma rugosum (Schltdl.) Sprague
Anemopaegma salicifolium (Kunth) Sandwith
Anemopaegma santaritense A. H. Gentry
Anemopaegma scabriusculum Mart. ex DC.
Anemopaegma scandens (Vell.) Corr. Méllo ex K. Schum., = **Anemopaegma chamberlaynii** (Sims) Bureau & K. Schum.
Anemopaegma setilobum A. H. Gentry
Anemopaegma velutinum Mart. ex DC.**
Anemopaegma villosum A. H. Gentry
Anemopaegma whitei Rusby, = **Fridericia whitei** (Rusby) L. G. Lohmann
Anisostichus Bureau, = **Bignonia** L.
Anisostichus capreolata (L.) Bureau, = **Bignonia capreolata** L.
Anisostichus crucigera (L.) Bureau ex Small, = **Amphilophium crucigerum** (L.) L. G. Lohmann
Anomoctenium Pichon, = **Amphilophium** Kunth
Anomoctenium granulosum (Bureau & K. Schum.) Sandwith, = **Amphilophium granulosum** (Bureau & K. Schum.) L. G. Lohmann

Anomoctenium stipulare (Mart. ex DC.) Pichon, = **Amphilophium frutescens** (DC.) L. G. Lohmann
Arrabidaea DC., = **Fridericia** Mart.
Arrabidaea sect. *Paracarpaea* K. Schum., = **Fridericia** Mart.
Arrabidaea affinis A. H. Gentry, = **Tanaecium affine** (A. H. Gentry) L. G. Lohmann
Arrabidaea argentea Wawra, = **Cuspidaria argentea** (Wawra) Sandwith
Arrabidaea arthrerion (Mart.) Bureau ex K. Schum., = **Fridericia arthrerion** (Mart.) L. G. Lohmann
Arrabidaea bahiensis (Schauer ex DC.) Sandwith & Moldenke, = **Fridericia bahiensis** (Schauer ex DC.) L. G. Lohmann
Arrabidaea bilabiata (Sprague) Sandwith, = **Tanaecium bilabiatum** (Sprague) L. G. Lohmann
Arrabidaea brachypoda Bureau, = **Fridericia platyphylla** (Cham.) L. G. Lohmann
Arrabidaea bracteolata (DC.) Sandwith, = **Fridericia bracteolata** (DC.) L. G. Lohmann
Arrabidaea candicans (Rich.) DC., = **Fridericia candicans** (Rich.) L. G. Lohmann
Arrabidaea carichanensis (Kunth) Bureau & K. Schum., = **Fridericia carichanensis** (Kunth) L. G. Lohmann
Arrabidaea caudigera (S. Moore) A. H. Gentry, = **Fridericia caudigera** (S. Moore) L. G. Lohmann
Arrabidaea celastroides Bureau ex K. Schum.**, = **Fridericia celastroides** (Bureau ex K. Schum.) L. G. Lohmann
Arrabidaea chica (Bonpl.) Verl., = **Fridericia chica** (Bonpl.) L. G. Lohmann
Arrabidaea chica var. *viscida* Donn. Sm., = **Fridericia viscida** (Donn. Sm.) L. G. Lohmann
Arrabidaea cinerea Bureau ex K. Schum.**, = **Fridericia cinerea** (Bureau ex K. Schum.) L. G. Lohmann
Arrabidaea cinnamomea (DC.) Sandwith, = **Fridericia cinnamomea** (DC.) L. G. Lohmann
Arrabidaea claussenii A. DC.**, = **Fridericia claussenii** (A. DC.) L. G. Lohmann
Arrabidaea conjugata (Vell.) Mart., = **Fridericia conjugata** (Vell.) L. G. Lohmann
Arrabidaea corallina (Jacq.) Sandwith, = **Fridericia dichotoma** (Jacq.) L. G. Lohmann
Arrabidaea corchoroides (Cham.) DC., = **Fridericia corchoroides** (Cham.) L. G. Lohmann
Arrabidaea corymbifera (Vahl) Bureau ex K. Schum., = **Lundia corymbifera** (Vahl) Sandwith
Arrabidaea costaricensis (Kraenzl.) A. H. Gentry, = **Fridericia costaricensis** (Kraenzl.) L. G. Lohmann
Arrabidaea crassa (Bureau & K. Schum.) Sprague, = **Fridericia crassa** (Bureau & K. Schum.) L. G. Lohmann
Arrabidaea craterophora (DC.) Bureau, = **Fridericia craterophora** (DC.) L. G. Lohmann
Arrabidaea cuneifolia (DC.) Sandwith, = **Fridericia cuneifolia** (DC.) L. G. Lohmann
Arrabidaea decora (S. Moore) Hassl., = **Bignonia decora** (S. Moore) L. G. Lohmann
Arrabidaea dichotoma Bureau, = **Tanaecium selloi** (Spreng.) L. G. Lohmann
Arrabidaea dispar Bureau ex K. Schum.**, = **Fridericia dispar** (Bureau ex K. Schum.) L. G. Lohmann
Arrabidaea egensis Bureau & K. Schum.**, = **Fridericia egensis** (Bureau & K. Schum.) L. G. Lohmann
Arrabidaea elegans (Vell.) A. H. Gentry, = **Fridericia elegans** (Vell.) L. G. Lohmann
Arrabidaea fagoides (Cham.) Bureau, = **Fridericia fagoides** (Cham.) L. G. Lohmann
Arrabidaea fanshawei Sandwith, = **Fridericia fanshawei** (Sandwith) L. G. Lohmann
Arrabidaea fasciculata (Vell.) DC., = **Tynanthus fasciculatus** (Vell.) Miers
Arrabidaea floribunda (Kunth) Loes., = **Fridericia floribunda** (Kunth) L. G. Lohmann
Arrabidaea florida DC.**, = **Fridericia florida** (DC.) L. G. Lohmann
Arrabidaea formosa (Bureau) Sandwith, = **Fridericia formosa** (Bureau) L. G. Lohmann
Arrabidaea grosourdyana (Baill.) Sandwith, = **Fridericia grosourdyana** (Baill.) L. G. Lohmann
Arrabidaea harleyi A. H. Gentry ex M. M. Silva & L. P. Queiroz, = **Xylophragma harleyi** (A. H. Gentry ex M. M. Silva & L. P. Queiroz) L. G. Lohmann
Arrabidaea japurensis (DC.) Bureau & K. Schum., = **Fridericia japurensis** (DC.) L. G. Lohmann
Arrabidaea inaequalis (DC. ex Splitg.) Bureau ex K. Schum., = **Cuspidaria inaequalis** (DC. ex Splitg.) L. G. Lohmann
Arrabidaea lachnaea (Bureau) Sandwith, = **Cuspidaria lachnaea** (Bureau) L. G. Lohmann
Arrabidaea lasiantha Bureau & K. Schum., = **Cuspidaria lasiantha** (Bureau & K. Schum.) L. G. Lohmann
Arrabidaea lauta Bureau & K. Schum.**, = **Fridericia lauta** (Bureau & K. Schum.) L. G. Lohmann
Arrabidaea leucopogon (Cham.) Sandwith, = **Fridericia leucopogon** (Cham.) L. G. Lohmann
Arrabidaea limae A. H. Gentry, = **Fridericia limae** (A. H. Gentry) L. G. Lohmann
Arrabidaea magnifica (W. Bull) Sprague ex Steenis, = **Bignonia magnifica** W. Bull
Arrabidaea mollis (Vahl) Bureau ex K. Schum., = **Fridericia mollis** (Vahl) L. G. Lohmann
Arrabidaea mollissima (Kunth) Bureau & K. Schum., = **Fridericia mollissima** (Kunth) L. G. Lohmann
Arrabidaea monophylla A. H. Gentry, = **Fridericia monophylla** (A. H. Gentry) L. G. Lohmann
Arrabidaea mutabilis Bureau & K. Schum.**, = **Tanaecium mutabile** (Bureau & K. Schum.) L. G. Lohmann
Arrabidaea nicotianiflora Kraenzl.**, = **Fridericia nicotianiflora** (Kraenzl.) L. G. Lohmann
Arrabidaea nigrescens Sandwith, = **Fridericia nigrescens** (Sandwith) L. G. Lohmann
Arrabidaea oligantha Bureau & K. Schum., = **Fridericia oligantha** (Bureau & K. Schum.) L. G. Lohmann
Arrabidaea ornithophila A. H. Gentry, = **Fridericia ornithophila** (A. H. Gentry) L. G. Lohmann
Arrabidaea oxycarpa Urb., = **Fridericia oxycarpa** (Urb.) L. G. Lohmann
Arrabidaea paniculata (L.) Seem., = **Amphilophium paniculatum** (L.) Kunth
Arrabidaea paradoxa (Sandwith) Sandwith, = **Fridericia paradoxa** (Sandwith) L. G. Lohmann
Arrabidaea parviflora (Mart. ex DC.) Bureau & K. Schum., = **Fridericia parviflora** (Mart. ex DC.) L. G. Lohmann
Arrabidaea patellifera (Schltdl.) Sandwith, = **Fridericia patellifera** (Schltdl.) L. G. Lohmann
Arrabidaea pearcei (Rusby) K. Schum. ex Urb., = **Fridericia pearcei** (Rusby) L. G. Lohmann
Arrabidaea platyphylla (Cham.) Bureau & K. Schum., = **Fridericia platyphylla** (Cham.) L. G. Lohmann
Arrabidaea platyphylla DC., = **Xylophragma platyphyllum** (DC.) L. G. Lohmann
Arrabidaea pliciflora (Mart. ex DC.) Bureau & K. Schum., = **Fridericia pliciflora** (Mart. ex DC.) L. G. Lohmann
Arrabidaea podopogon (DC.) A. H. Gentry, = **Fridericia podopogon** (DC.) L. G. Lohmann
Arrabidaea poeppigii (DC.) Sandwith, = **Fridericia poeppigii** (DC.) L. G. Lohmann

Arrabidaea potosina K. Schum. & Loes., = **Bignonia potosina** (K. Schum. & Loes.) L. G. Lohmann
Arrabidaea prancei A. H. Gentry, = **Fridericia prancei** (A. H. Gentry) L. G. Lohmann
Arrabidaea puberula (Mart. ex DC.) Bureau, = **Cuspidaria puberula** Mart. ex DC.
Arrabidaea pubescens (L.) A. H. Gentry, = **Fridericia pubescens** (L.) L. G. Lohmann
Arrabidaea pulchella (Cham.) Bureau, = **Cuspidaria pulchella** (Cham.) K. Schum.
Arrabidaea pulchra (Cham.) Sandwith, = **Cuspidaria pulchra** (Cham.) L. G. Lohmann
Arrabidaea rego (Vell.) DC., = **Fridericia rego** (Vell.) L. G. Lohmann
Arrabidaea revillae A. H. Gentry, = **Tanaecium revillae** (A. H. Gentry) L. G. Lohmann
Arrabidaea samydoides (Cham.) Sandwith, = **Fridericia samydoides** (Cham.) L. G. Lohmann
Arrabidaea sceptrum (Cham.) Sandwith, = **Cuspidaria sceptrum** (Cham.) L. G. Lohmann
Arrabidaea sciuripabulum K. Schum., = **Bignonia sciuripabulum** (K. Schum.) L. G. Lohmann
Arrabidaea selloi (Spreng.) Sandwith, = **Tanaecium selloi** (Spreng.) L. G. Lohmann
Arrabidaea simplex A. H. Gentry, = **Fridericia simplex** (A. H. Gentry) L. G. Lohmann
Arribadaea sordida Bureau & K. Schum., = **Bignonia sordida** (Bureau & K. Schum.) L. G. Lohmann
Arrabidaea spicata Bureau & K. Schum., = **Fridericia spicata** (Bureau & K. Schum.) L. G. Lohmann
Arrabidaea subexserta Bureau & K. Schum.**, = **Fridericia subexserta** (Bureau & K. Schum.) L. G. Lohmann
Arrabidaea subincana Mart., = **Fridericia subincana** (Mart.) L. G. Lohmann
Arrabidaea subverticillata Bureau & K. Schum., = **Fridericia subverticillata** (Bureau & K. Schum.) L. G. Lohmann
Arrabideaea trachyphylla (Bureau & K. Schum.) Sandwith, = **Fridericia trachyphylla** (Bureau & K. Schum.) L. G. Lohmann
Arrabidaea trailii Sprague, = **Fridericia trailii** (Sprague) L. G. Lohmann
Arrabidaea trichoclada (DC.) Bureau & K. Schum., = **Adenocalymma trichocladum** (DC.) L. G. Lohmann
Arrabidaea triplinervia (Mart. ex DC.) Baill. ex Bureau, = **Fridericia triplinervia** (Mart. ex DC.) L. G. Lohmann
Arrabidaea truncata (Sprague) Sandwith, = **Fridericia truncata** (Sprague) L. G. Lohmann
Arrabidaea tuberculata DC., = **Fridericia pilulifera** (Rich.) L. G. Lohmann
Arrabidaea tynanthoides A. H. Gentry, = **Fridericia tynanthoides** (A. H. Gentry) L. G. Lohmann
Arrabidaea verrucosa (Standl.) A. H. Gentry, = **Fridericia schumanniana** (Loes.) L. G. Lohmann
Arrabidaea viscida (Donn. Sm.) A. H. Gentry, = **Fridericia viscida** (Donn. Sm.) L. G. Lohmann
Arrabidaea weberbaueri Sprague, = **Cuspidaria weberbaueri** (Sprague) A. H. Gentry
Arrabidaea whitei (Rusby) Sandwith, = **Fridericia whitei** (Rusby) L. G. Lohmann
Arrabidaea xanthophylla (DC.) Bureau & K. Schum., = **Tanaecium xanthophyllum** (DC.) L. G. Lohmann
Batocydia Mart. ex Britton & Wilson, = **Dolichandra** Cham.
Batocydia unguis-cati (L.) Mart. ex Britton, = **Dolichandra unguis-cati** (L.) L. G. Lohmann
Bayonia Dugand, = **Mansoa** DC.
Bayonia helicocalyx (Kuntze) Dugand, = **Mansoa verrucifera** (Schltdl.) A. H. Gentry
Bignonia L.
Bignonia aequinoctialis L.
Bignonia aequinoctialis var. *chamberlaynii* (Sims) Ker Gawl., = **Anemopaegma chamberlaynii** (Sims) Bureau & K. Schum.
Bignonia alba Aubl., = **Adenocalymma album** (Aubl.) L. G. Lohmann
Bignonia albiflora Salzm. ex DC., = **Pleonotoma albiflora** (Salzm. ex DC.) A. H. Gentry
Bignonia alliacea Lam., = **Mansoa alliacea** (Lam.) A. H. Gentry
Bignonia apurensis Kunth, = **Adenocalumma apurense** (Kunth) Sandwith
Bignonia arthrerion Mart., = **Fridericia arthrerion** (Mart.) L. G. Lohmann
Bignonia arvensis Vell.**, = **Anemopaegma arvense** (Vell.) Stellfeld ex J. F. Souza
Bignonia binata Thunb.
Bignonia brachypoda DC., = **Fridericia platyphylla** (Cham.) L. G. Lohmann
Bignonia brachypoda var. *platyphylla* (Cham.) DC., = **Fridericia platyphylla** (Cham.) L. G. Lohmann
Bignonia bracteata Cham., = **Adenocalymma bracteatum** (Cham.) DC.
Bignonia bracteolata DC., = **Fridericia bracteolata** (DC.) L. G. Lohmann
Bignonia bracteomana (K. Schum.) L. G. Lohmann
Bignonia buccinatoria (DC.) Mairet ex Hemsl., = **Amphilophium buccinatorium** (DC.) L. G. Lohmann
Bignonia callistegioides Cham.
Bignonia carolinae Lindl., = **Amphilophium carolinae** (Lindl.) L. G. Lohmann
Bignonia campanulata Cham.
Bignonia candicans Rich., = **Fridericia candicans** (Rich.) L. G. Lohmann
Bignonia capreolata L.
Bignonia carichanensis Kunth, = **Fridericia carichanensis** (Kunth) L. G. Lohmann
Bignonia caudigera S. Moore, = **Fridericia caudigera** (S. Moore) L. G. Lohmann
Bignonia chamberlaynii Sims**, = **Anemopaegma chamberlaynii** (Sims) Bureau & K. Schum.
Bignonia chrysoleuca Kunth, = **Anemopaegma chrysoleucum** (Kunth) Sandwith
Bignonia chica Bonpl., = **Fridericia chica** (Bonpl.) L. G. Lohmann
Bignonia cinnamomea DC., = **Fridericia cinnamomea** (DC.) L. G. Lohmann
Bignonia clematis Kunth, = **Pleonotoma clematis** (Kunth) Miers
Bignonia cognata Cham., = **Tynanthus cognatus** (Cham.) Miers
Bignonia comosa Cham., = **Adenocalymma comosum** (Cham.) DC.
Bignonia conjugata Vell.**, = **Fridericia conjugata** (Vell.) L. G. Lohmann
Bignonia convoluta Vell.**, = **Cuspidaria convoluta** (Vell.) A. H. Gentry
Bignonia convolvuloides (Bureau & K. Schum.) L. G. Lohmann
Bignonia corallina Jacq., = **Fridericia dichotoma** (Jacq.) L. G. Lohmann
Bignonia corchoroides Cham., = **Fridericia corchoroides** (Cham.) L. G. Lohmann
Bignonia cordata Vell.**, = **Lundia corymbifera** (Vahl) Sandwith

Bignonia cordifolia DC. = **Manaosella cordifolia** (DC.) A. H. Gentry
Bignonia corymbifera Vahl = **Lundia corymbifera** (Vahl) Sandwith
Bignonia corymbosa (Vent.) L. G. Lohmann
Bignonia costata (Bureau & K. Schum.) L. G. Lohmann
Bignonia craterophora DC. = **Fridericia craterophora** (DC.) L. G. Lohmann
Bignonia crucigera L., = **Amphilophium crucigerum** (L.) L. G. Lohmann
Bignonia cuneata (Dugand) L. G. Lohmann
Bignonia cuneifolia DC., = **Fridericia cuneifolia** (DC.) L. G. Lohmann
Bignonia cymbalum Cham., = **Adenocalymma cymbalum** (Cham.) Bureau & K. Schum.
Bignonia decora (S. Moore) L. G. Lohmann
Bignonia dichotoma Jacq., = **Fridericia dichotoma** (Jacq.) L. G. Lohmann
Bignonia difficilis Cham., = **Mansoa difficilis** (Cham.) Bureau & K. Schum.
Bignonia diversifolia Kunth
Bignonia dolichoides Cham., = **Amphilophium dolichoides** (Cham.) L. G. Lohmann
Bignonia elegans Cham., = **Tynanthus elegans** Miers
Bignonia elegans Vell.**, = **Fridericia elegans** (Vell.) L. G. Lohmann
Bignonia elongata Vahl, = **Amphilophium elongatum** (Vahl) L. G. Lohmann
Bignonia erubescens DC.**, = **Fridericia erubescens** (DC.) L. G. Lohmann
Bignonia fagoides Cham., = **Fridericia fagoides** (Cham.) L. G. Lohmann
Bignonia falcata Vell., = **Amphilophium falcatum** (Vell.) L. G. Lohmann
Bignonia fallax Cham., = **Adenocalymma pubescens** (Spreng.) L. G. Lohmann
Bignonia fasciculata Vell.**, = **Tynanthus fasciculatus** (Vell.) Miers
Bignonia flavida DC.**, = **Adenocalymma validum** (K. Schum.) L. G. Lohmann
Bignonia floribunda Kunth, = **Fridericia floribunda** (Kunth) L. G. Lohmann
Bignonia fluminensis Vell.**, = **Pleonotoma fluminensis** (Vell.) A. H. Gentry
Bignonia gnaphalantha A. Rich., = **Amphilophium gnaphalanthum** (A. Rich.) L. G. Lohmann
Bignonia grandifolia Jacq.**, = **Anemopaegma grandifolium** (Jacq.) Merr. & Sandwith
Bignonia grandifolia Vell., = **Adenocalymma grandifolium** Mart. ex DC.
Bignonia heterophylla Willd., = **Pachyptera kerere** (Aubl.) Sandwith
Bignonia hyancinthina (Standl.) L. G. Lohmann
Bignonia hymenaea DC., = **Mansoa hymenaea** (DC.) A. H. Gentry
Bignonia imperatoris-maximilianii Wawra, = **Adenocalymma imperatoris-maximilianii** (Wawra) L. G. Lohmann
Bignonia impressa Rusby**, = **Adenocalymma impressum** (Rusby) Sandwith
Bignonia inaequalis DC. ex Splitg., = **Cuspidaria inaequalis** (DC. ex Splitg.) L. G. Lohmann
Bignonia jasminifolia Kunth, = **Pleonotoma jasminifolia** (Kunth) Miers
Bignonia kerere Aubl., = **Pachyptera kerere** (Aubl.) Sandwith
Bignonia labiatus Cham., = **Tynanthus labiatus** (Cham.) Miers
Bignonia lactiflora Vahl, = **Amphilophium lactiflorum** (Vahl) L. G. Lohmann
Bignonia latifolia Rich.**, = **Callichlamys latifolia** (Rich.) K. Schum.
Bignonia lenta Mart. ex DC., = **Tanaecium pyramidatum** (Rich.) L. G. Lohmann
Bignonia leucopogon Cham., = **Fridericia leucopogon** (Cham.) L. G. Lohmann
Bignonia lilacina (A. H. Gentry) L. G. Lohmann
Bignonia longa Vell.**, = **Lundia longa** (Vell.) DC.
Bignonia longiflora Cav.**
Bignonia magnifica W. Bull
Bignonia magnoliifolia Kunth., = **Amphilophium magnoliifolium** (Kunth) L. G. Lohmann
Bignonia mansoana DC., = **Amphilophium mansoanum** (DC.) L. G. Lohmann
Bignonia marginata Cham., = **Adenocalymma marginatum** (Cham.) DC.
Bignonia melioides S. Moore, = **Pleonotoma melioides** (S. Moore) A. H. Gentry
Bignonia microcalyx G. Mey.
Bignonia mollis Vahl, = **Fridericia mollis** (Vahl) L. G. Lohmann
Bignonia mollissima Kunth, = **Fridericia mollissima** (Kunth) L. G. Lohmann
Bignonia moringifolia DC., = **Adenocalymma moringifolium** (DC.) L. G. Lohmann
Bignonia myriantha Cham., = **Xylophragma myrianthum** (Cham.) Sprague
Bignonia neoheterophylla L. G. Lohmann
Bignonia neouliginosa L. G. Lohmann
Bignonia nocturna (Barb. Rodr.) L. G. Lohmann
Bignonia nodosa Silva Manso, = **Adenocalymma nodosum** (Silva Manso) L. G. Lohmann
Bignonia obovata (Kunth) Spreng., = **Martinella obovata** (Kunth) Bureau & K. Schum.
Bignonia orbiculata Jacq., = **Anemopaegma orbiculatum** (Jacq.) DC.
Bignonia paniculata L., = **Amphilophium paniculatum** (L.) Kunth
Bignonia pannosa DC., = **Amphilophium pannosum** (DC.) Bureau & K. Schum.
Bignonia parkeri DC., = **Amphilophium parkeri** (DC.) L. G. Lohmann
Bignonia patellifera Schltdl., = **Fridericia patellifera** (Schltdl.) L. G. Lohmann
Bignonia pearcei Rusby, = **Fridericia pearcei** (Rusby) L. G. Lohmann
Bignonia pedunculata Vell.**, = **Adenocalymma pedunculatum** (Vell.) L. G. Lohmann
Bignonia perforata Cham., = **Stizophyllum perforatum** (Cham.) Miers
Bignonia perianthomega Vell.**, = **Perianthomega vellozoi** Bureau
Bignonia phellosperma (Hemsl.) L. G. Lohmann
Bignonia pilulifera Rich., = **Fridericia pilulifera** (Rich.) L. G. Lohmann
Bignonia platyphylla Cham., = **Fridericia platyphylla** (Cham.) L. G. Lohmann
Bignonia potosina (K. Schum. & Loes.) L. G. Lohmann
Bignonia prieurii DC.
Bignonia pterocalyx (Sprague ex Urb.) L. G. Lohmann
Bignonia pubescens L., = **Fridericia pubescens** (L.) L. G. Lohmann
Bignonia pulchella Cham., = **Cuspideria pulchella** (Cham.) K. Schum.

Bignonia pulchra Cham., = **Cuspidaria pulchra** (Cham.) L. G. Lohmann
Bignonia pyramidata Rich., = **Tanaecium pyramidatum** (Rich.) L. G. Lohmann
Bignonia quadrivalvis Jacq.**, = **Dolichandra quadrivalvis** (Jacq.) L. G. Lohmann
Bignonia ramentacea (Mart. ex DC.) L. G. Lohmann
Bignonia rego Vell.**, = **Fridericia rego** (Vell.) L. G. Lohmann
Bignonia riparia Kunth, = **Stizophyllum riparium** (Kunth) Sandwith
Bignonia rugosa Schltdl., = **Anemopaegma rugosum** (Schltdl.) Sprague
Bignonia salicifolia Kunth., = **Anemopaegma salicifolium** (Kunth) Sandwith
Bignonia samydoides Cham., = **Fridericia samydoides** (Cham.) L. G. Lohmann
Bignonia scandens Vell.**, = **Anemopaegma chamberlaynii** (Sims) Bureau & K. Schum.
Bignonia sceptrum Cham., = **Cuspidaria sceptrum** (Cham.) L. G. Lohmann
Bignonia sciuripabulum (K. Schum.) L. G. Lohmann
Bignonia sego Vell., = **Fridericia rego** (Vell.) L. G. Lohmann
Bignonia selloi Spreng.**, = **Tanaecium selloi** (Spreng.) L. G. Lohmann
Bignonia sordida (Bureau & K. Schum.) L. G. Lohmann
Bignonia staminea Lam., = **Amphilophium stamineum** (Lam.) L. G. Lohmann
Bignonia ternata Vell.**, = **Adenocalymma ternatum** (Vell.) Corr. Méllo ex Bureau & K. Schum.
Bignonia tetragonoloba Jacq.**, = **Tanaecium tetragonolobum** (Jacq.) L. G. Lohmann
Bignonia tetraquetra Cham., = **Pleonotoma tetraquetra** (Cham.) Bureau
Bignonia trichoclada DC., = **Adenocalymma trichocladum** (DC.) L. G. Lohmann
Bignonia trifoliata Vell., = **Adenocalymma trifoliatum** (Vell.) R. C. Laroche
Bignonia triplinervia Mart. ex DC., = **Fridericia triplinervia** (Mart. ex DC.) L. G. Lohmann
Bignonia uleana (Kraenzl.) L. G. Lohmann
Bignonia uliginosa Gomes, = *Tabebuia cassinoides* (Lam.) DC.
Bignonia uncata Andrews, = **Dolichandra uncata** (Andrews) L. G. Lohmann
Bignonia unguiculata Vell.**, = **Dolichandra unguiculata** (Vell.) L. G. Lohmann
Bignonia unguis-cati L., = **Dolichandra unguis-cati** (L.) L. G. Lohmann
Bignonia variabilis Jacq., = **Pleonotoma variabilis** (Jacq.) Miers
Bignonia venusta Ker Gawl., = **Pyrostegia venusta** (Ker Gawl.) Miers
Bignonia verrucifera Schltdl., = **Mansoa verrucifera** (Schltdl.) A. H. Gentry
Blepharitheca Pichon, = **Cuspidaria** DC.
Blepharitheca argentea (Wawra) Pichon, = **Cuspidaria argentea** (Wawra) Sandwith
Blepharitheca floribunda (DC.) Pichon, = **Cuspidaria floribunda** (DC.) A. H. Gentry
Blepharitheca puberula (Mart. ex DC.) Pichon, = **Cuspidaria puberula** Mart. ex DC.
Bothriopodium Rizzini, = **Amphilophium** Kunth
Bothiopodium glaziovii (Bureau ex K. Schum.) Rizzini, = **Amphilophium dusenianum** (Kraenzl.) L. G. Lohmann
Callichlamys Miq.
Callichlamys latifolia (Rich.) K. Schum.
Callichlamys riparia Miq., = **Callichlamys latifolia** (Rich.) K. Schum.
Ceratophytum Pittier, = **Tanaecium** Sw.
Ceratophytum capricorne Pittier, = **Tanaecium tetragonolobum** (Jacq.) L. G. Lohmann
Ceratophytum tetragonolobum (Jacq.) Sprague & Sandwith, = **Tanaecium tetragonolobum** (Jacq.) L. G. Lohmann
Chasmia Schott ex Spreng., = **Fridericia** Mart.
Chasmia Schott ex Kuntze, = **Fridericia** Mart.
Chasmia rego (Vell.) Kuntze, = **Fridericia rego** (Vell.) L. G. Lohmann
Chodanthus Hassl., = **Mansoa** DC.
Chodanthus montecillense Ant. Molina, = **Mansoa montecillensis** (Ant. Molina) C. Nelson
Chodanthus puberulus Seibert, = **Anemopaegma puberulum** (Seibert) Miranda
Chodanthus splendens (Bureau & K. Schum.) Hassl., = **Mansoa difficilis** (Cham.) Bureau & K. Schum.
Clytostoma Miers ex Bureau, = **Bignonia** L.
Clytostoma binatum (Thunb.) Sandwith, = **Bignonia binata** Thunb.
Clytostoma callistegioides (Cham.) Bureau ex Griseb., = **Bignonia callistegioides** Cham.
Clytostoma campanulatum (Cham.) Bureau & K. Schum., = **Bignonia campanulata** Cham.
Clytostoma convolvuloides Bureau & K. Schum.**, = **Bignonia convolvuloides** (Bureau & K. Schum.) L. G. Lohmann
Clytostoma costatum Bureau & K. Schum.**, = **Bignonia costata** (Bureau & K. Schum.) L. G. Lohmann
Clytostoma cuneatum Dugand, = **Bignonia cuneata** (Dugand) L. G. Lohmann
Clytostoma decorum (S. Moore) Bureau & K. Schum., = **Bignonia decora** (S. Moore) L. G. Lohmann
Clytostoma pterocalyx Sprague ex Urb.**, = **Bignonia pterocalyx** (Sprague ex Urb.) L. G. Lohmann
Clytostoma ramentaceum (Mart. ex DC.) Bureau & K. Schum., = **Bignonia ramentacea** (Mart. ex DC.) L. G. Lohmann
Clytostoma sciuripabulum (K. Schum.) Bureau & K. Schum., = **Bignonia sciuripabulum** (K. Schum.) L. G. Lohmann
Clytostoma uleanum Kraenzl., = **Bignonia uleana** (Kraenzl.) L. G. Lohmann
Clytostomanthus Pichon, = **Bignonia** L.
Clytostomanthus decorus (S. Moore) Pichon, = **Bignonia decora** (S. Moore) L. G. Lohmann
Craterotecoma Mart. ex Meisn., = **Lundia** DC.
Craterotecoma parviflora DC., = **Lundia erionema** DC.
Cremastus Miers, = **Cuspidaria** DC.
Cremastus glutinosus (DC.) Miers, = **Cuspidaria sceptrum** (Cham.) L. G. Lohmann
Cremastus lachnaeus Bureau**, = **Cuspidaria lachnaea** (Bureau) L. G. Lohmann
Cremastus pulcher (Cham.) Bureau, = **Cuspidaria pulchra** (Cham.) L. G. Lohmann
Cremastus sceptrum (Cham.) Bureau & K. Schum., = **Cuspidaria sceptrum** (Cham.) L. G. Lohmann
Cupulissa Raf., = **Anemopaegma** Mart. ex Meisn.
Cupulissa grandifolia (Jacq.) Raf., = **Anemopaegma grandifolium** (Jacq.) Merr. & Sandwith
Cuspidaria DC.
Cuspidaria angustidens DC., = **Mansoa angustidens** (DC.) Bureau & K. Schum.
Cuspidaria argentea (Wawra) Sandwith
Cuspidaria bracteata (Bureau & K. Schum.) L. G. Lohmann
Cuspidaria callistegioides (Cham.) DC., = **Bignonia callistegioides** Cham.

Cuspidaria campanulata (Cham.) DC., = **Bignonia campanulata** Cham.
Cuspidaria cinerea (Bureau ex K. Schum.) L. G. Lohmann
Cuspidaria convoluta (Vell.) A. H. Gentry
Cuspidaria corymbifera (Vahl) Baill. ex K. Schum., = **Lundia corymbifera** (Vahl) Sandwith
Cuspidaria cratensis (J. C. Gomes) A. H. Gentry ex L. G. Lohmann
Cuspidaria emmonsii A. H. Gentry
Cuspidaria erubescens (DC.) Bureau, = **Fridericia erubescens** (DC.) L. G. Lohmann
Cuspidaria fasciculata (Vell.) Sond., = **Tynanthus fasciculatus** (Vell.) Miers
Cuspidaria floribunda (DC.) A. H. Gentry
Cuspidaria hymenaea (DC.) M. R. Almeida, = **Mansoa hymenaea** (DC.) A. H. Gentry
Cuspidaria inaequalis (DC. ex Splitg.) L. G. Lohmann
Cuspidaria lachnaea (Bureau) L. G. Lohmann
Cuspidaria lasiantha (Bureau & K. Schum.) L. G. Lohmann
Cuspidaria lateriflora (Mart.) DC.
Cuspidaria multiflora DC.**
Cuspidaria octoptera A. H. Gentry
Cuspidaria pterocarpa (Cham.) DC., = **Cuspidaria convoluta** (Vell.) A. H. Gentry
Cuspidaria puberula Mart. ex DC., = **Cuspidaria simplicifolia** DC.
Cuspidaria pulchella (Cham.) K. Schum.
Cuspidaria pulchra (Cham.) L. G. Lohmann
Cuspidaria ramentacea Mart. ex DC., = **Bignonia ramentacea** (Mart. ex DC.) L. G. Lohmann
Cuspidaria sceptrum (Cham.) L. G. Lohmann
Cuspidaria schumanniana Kuntze, = **Tynanthus schumannianus** (Kuntze) A. H. Gentry
Cuspidaria simplicifolia DC.
Cuspidaria subincana A. H. Gentry
Cuspidaria weberbaueri (Sprague) A. H. Gentry
Cydista Miers, = **Bignonia** L.
Cydista aequinoctialis (L.) Miers, = **Bignonia aequinoctialis** L.
Cydista bracteomana K. Schum., = **Bignonia bracteomana** (K. Schum.) L. G. Lohmann
Cydista decora (S. Moore) A. H. Gentry, = **Bignonia decora** (S. Moore) L. G. Lohmann
Cydista difficilis (Cham.) Miers, = **Mansoa difficilis** (Cham.) Bureau & K. Schum.
Cydista diversifolia (Kunth) Miers, = **Bignonia diversifolia** Kunth
Cydista heterophylla Seibert, = **Bignonia neoheterophylla** L. G. Lohmann
Cydista lilacina A. H. Gentry, = **Bignonia lilacina** (A. H. Gentry) L. G. Lohmann
Cydista potosina (K. Schum. & Loes.) Loes., = **Bignonia potosina** (K. Schum. & Loes.) L. G. Lohmann
Danielia Corr. Méllo ex Verlot, = **Mansoa** DC.
Danielia splendens Corr. Méllo ex Verlot, = **Mansoa difficilis** (Cham.) Bureau & K. Schum.
[*Delostoma* D. Don, Bignoniaceae, Tribe Tecomeae]
Delostoma latifolium (Rich.) Splitg., = **Callichlamys latifolia** (Rich.) K. Schum.
Distictella Kuntze, = **Amphilophium** Kunth
Distictella arenaria A. H. Gentry, = **Amphilophium arenarium** (A. H. Gentry) L. G. Lohmann
Distictella campinae A. Samp., = **Amphilophium campinae** (A. Samp.) L. G. Lohmann
Distictella chocoensis A. H. Gentry, = **Amphilophium chocoense** (A. H. Gentry) L. G. Lohmann
Distictella crassa (Bureau & K. Schum.) Urb., = **Fridericia crassa** (Bureau & K. Schum.) L. G. Lohmann
Distictella cremersii A. H. Gentry, = **Amphilophium cremersii** (A. H. Gentry) L. G. Lohmann
Distictella cuneifolia (DC.) Sandwith, = **Amphilophium cuneifolium** (DC.) L. G. Lohmann
Distictella dasytricha Sandwith, = **Amphilophium dasytrichum** (Sandwith) L. G. Lohmann
Distictella elongata (Vahl) Urb., = **Amphilophium elongatum** (Vahl) L. G. Lohmann
Distictella granulosa (Bureau & K. Schum.) Sandwith, = **Amphilophium granulosum** (Bureau & K. Schum.) L. G. Lohmann
Distictella laevis (Sandwith) A. H. Gentry, = **Amphilophium laeve** (Sandwith) L. G. Lohmann
Distictella lohmanniae A. Pool, = **Amphilophium lohmanniae** (A. Pool) L. G. Lohmann
Distictella magnoliifolia (Kunth) Sandwith, = **Amphilophium magnoliifolium** (Kunth) L. G. Lohmann
Distictella mansoana (DC.) Urb., = **Amphilophium mansoanum** (DC.) L. G. Lohmann
Distictella monophylla Sandwith, = **Amphilophium monophyllum** (Sandwith) L. G. Lohmann
Distictella monophylla var. *laevis* Sandwith, = **Amphilophium laeve** (Sandwith) L. G. Lohmann
Distictella obovata Sandwith, = **Amphilophium obovatum** (Sandwith) L. G. Lohmann
Distictella parkeri (DC.) Sprague & Sandwith, = **Amphilophium parkeri** (DC.) L. G. Lohmann
Distictella pauciflora A. H. Gentry, = **Amphilophium pauciflorum** (A. H. Gentry) L. G. Lohmann
Distictella porphyrotricha Sandwith, = **Amphilophium porphyrotrichum** (Sandwith) L. G. Lohmann
Distictella pulverulenta Sandwith, = **Amphilophium pulverulentum** (Sandwith) L. G. Lohmann
Distictella racemosa (Bureau & K. Schum.) Urb., = **Amphilophium racemosum** (Bureau & K. Schum.) L. G. Lohmann
Distictella reticulata A. H. Gentry, = **Amphilophium reticulatum** (A. H. Gentry) L. G. Lohmann
Distictis Mart. ex Meisn., = **Amphilophium** Kunth
Distictis arthrerion (Mart.) DC., = **Fridericia arthrerion** (Mart.) L. G. Lohmann
Distictis buccinatoria (DC.) A. H. Gentry, = **Amphilophium buccinatorium** (DC.) L. G. Lohmann
Distictis crassa Bureau & K. Schum.**, = **Fridericia crassa** (Bureau & K. Schum.) L. G. Lohmann
Distictis elongata (Vahl) Bureau ex Benth., = **Amphilophium elongatum** (Vahl) L. G. Lohmann
Distictis frutescens (DC.) A. Pool, = **Amphilophium frutescens** (DC.) L. G. Lohmann
Distictis glaziovii (Bureau ex K. Schum.) Bureau & K. Schum., = **Amphilophium dusenianum** (Kraenzl.) L. G. Lohmann
Distictis gnaphalantha (A. Rich.) Greenm., = **Amphilophium gnaphalanthum** (A. Rich.) L. G. Lohmann
Distictis gnaphalantha (A. Rich.) Urb., = **Amphilophium gnaphalanthum** (A. Rich.) L. G. Lohmann
Distictis granulosa Bureau & K. Schum., = **Amphilophium granulosum** (Bureau & K. Schum.) L. G. Lohmann
Distictis lactiflora (Vahl) DC., = **Amphilophium lactiflorum** (Vahl) L. G. Lohmann
Distictis laxiflora (DC.) Greenm., = **Amphilophium laxiflorum** (DC.) L. G. Lohmann
Distictis mansoana (DC.) Bureau, = **Amphilophium mansoanum** (DC.) L. G. Lohmann
Distictis occidentalis A. H. Gentry, = **Amphilophium occidentale** (A. H. Gentry) L. G. Lohmann

Distictis pulverulenta (Sandwith) A. H. Gentry, = **Amphilophium pulverulentum** (Sandwith) L. G. Lohmann
Distictis racemosa Bureau & K. Schum., = **Amphilophium racemosum** (Bureau & K. Schum.) L. G. Lohmann
Distictis scabriuscula (Mart. ex DC.) A. H. Gentry, = **Amphilophium scabriusculum** (Mart. ex DC.) L. G. Lohmann
Distictis staminea (Lam.) A. H. Gentry, = **Amphilophium stamineum** (Lam.) L. G. Lohmann
Distictis steyermarkii A. H. Gentry, = **Amphilophium steyermarkii** (A. H. Gentry) L. G. Lohmann
Distictis stipularis (Mart. ex DC.) A. H. Gentry, = **Amphilophium frutescens** (DC.) L. G. Lohmann
Dolichandra Cham.
Dolichandra chodatii (Hassl.) L. G. Lohmann
Dolichandra cynanchoides Cham.
Dolichandra dentata (K. Schum.) L. G. Lohmann
Dolichandra quadrivalvis (Jacq.) L. G. Lohmann
Dolichandra steyermarkii (Sandwith) L. G. Lohmann
Dolichandra uncata (Andrews) L. G. Lohmann
Dolichandra unguiculata (Vell.) L. G. Lohmann
Dolichandra unguis-cati (L.) L. G. Lohmann
Doxantha Miers, = **Dolichandra** Cham.
Doxantha capreolata (L.) Miers, = **Bignonia capreolata** L.
Doxantha elongata (Vahl) Miers, = **Amphilophium elongatum** (Vahl) L. G. Lohmann
Doxantha uncata (Andrews) Miers, = **Dolichandra uncata** (Andrews) L. G. Lohmann
Doxantha unguiculata (Vell.) Miers, = **Dolichandra unguiculata** (Vell.) L. G. Lohmann
Doxantha unguis-cati (L.) Miers, = **Dolichandra unguis-cati** (L.) L. G. Lohmann
Endoloma Raf., = **Amphilophium** Kunth
Endoloma purpurea Raf., = **Amphilophium paniculatum** (L.) Kunth
Exsertanthera Pichon, = **Lundia** DC.
Exsertanthera longa (Vell.) Pichon, = **Lundia longa** (Vell.) DC.
Fridericia Mart.
Fridericia arthrerion (Mart.) L. G. Lohmann
Fridericia bahiensis (Schauer ex DC.) L. G. Lohmann
Fridericia bracteolata (DC.) L. G. Lohmann
Fridericia candicans (Rich.) L. G. Lohmann
Fridericia carichanensis (Kunth) L. G. Lohmann
Fridericia caudigera (S. Moore) L. G. Lohmann
Fridericia celastroides (Bureau ex K. Schum.) L. G. Lohmann
Fridericia chica (Bonpl.) L. G. Lohmann
Fridericia cinerea (Bureau ex K. Schum.) L. G. Lohmann
Fridericia cinnamomea (DC.) L. G. Lohmann
Fridericia claussenii (A. DC.) L. G. Lohmann
Fridericia conjugata (Vell.) L. G. Lohmann
Fridericia corchoroides (Cham.) L. G. Lohmann
Fridericia costaricensis (Kraenzl.) L. G. Lohmann
Fridericia crassa (Bureau & K. Schum.) L. G. Lohmann
Fridericia craterophora (DC.) L. G. Lohmann
Fridericia cuneifolia (DC.) L. G. Lohmann
Fridericia dichotoma (Jacq.) L. G. Lohmann
Fridericia dispar (Bureau ex K. Schum.) L. G. Lohmann
Fridericia egensis (Bureau & K. Schum.) L. G. Lohmann
Fridericia elegans (Vell.) L. G. Lohmann
Fridericia erubescens (DC.) L. G. Lohmann
Fridericia fagoides (Cham.) L. G. Lohmann
Fridericia fanshawei (Sandwith) L. G. Lohmann
Fridericia floribunda (Kunth) L. G. Lohmann
Fridericia florida (DC.) L. G. Lohmann
Fridericia formosa (Bureau) L. G. Lohmann
Fridericia grosourdyana (Baill.) L. G. Lohmann
Fridericia japurensis (DC.) L. G. Lohmann
Fridericia lasiantha (Bureau & K. Schum.) L. G. Lohmann, = **Cuspidaria lasiantha** (Bureau & K. Schum.) L. G. Lohmann
Fridericia lauta (Bureau & K. Schum.) L. G. Lohmann
Fridericia leucopogon (Cham.) L. G. Lohmann
Fridericia limae (A. H. Gentry) L. G. Lohmann
Fridericia mollis (Vahl) L. G. Lohmann
Fridericia mollissima (Kunth) L. G. Lohmann
Fridericia monophylla (A. H. Gentry) L. G. Lohmann
Fridericia mutabilis (Bureau & K. Schum.) L. G. Lohmann, = **Tanaecium mutabile** (Bureau & K. Schum.) L. G. Lohmann
Fridericia nicotianiflora (Kraenzl.) L. G. Lohmann
Fridericia nigrescens (Sandwith) L. G. Lohmann
Fridericia oligantha (Bureau & K. Schum.) L. G. Lohmann
Fridericia ornithophila (A. H. Gentry) L. G. Lohmann
Fridericia oxycarpa (Urb.) L. G. Lohmann
Fridericia paradoxa (Sandwith) L. G. Lohmann
Fridericia parviflora (Mart. ex DC.) L. G. Lohmann
Fridericia patellifera (Schltdl.) L. G. Lohmann
Fridericia pearcei (Rusby) L. G. Lohmann
Fridericia platyphylla (Cham.) L. G. Lohmann
Fridericia pliciflora (Mart. ex DC.) L. G. Lohmann
Fridericia podopogon (DC.) L. G. Lohmann
Fridericia poeppigii (DC.) L. G. Lohmann
Fridericia prancei (A. H. Gentry) L. G. Lohmann
Fridericia pubescens (L.) L. G. Lohmann
Fridericia pulchella (Cham.) L. G. Lohmann, = **Cuspidaria pulchella** (Cham.) K. Schum
Fridericia rego (Vell.) L. G. Lohmann
Fridericia samydoides (Cham.) L. G. Lohmann
Fridericia schumanniana (Loes.) L. G. Lohmann
Fridericia simplex (A. H. Gentry) L. G. Lohmann
Fridericia speciosa Mart.**
Fridericia spicata (Bureau & K. Schum.) L. G. Lohmann
Fridericia subexserta (Bureau & K. Schum.) L. G. Lohmann
Fridericia subincana (Mart.) L. G. Lohmann
Fridericia subverticillata (Bureau & K. Schum.) L. G. Lohmann
Fridericia trachyphylla (Bureau & K. Schum.) L. G. Lohmann
Fridericia trailii (Sprague) L. G. Lohmann
Fridericia triplinervia (Mart. ex DC.) L. G. Lohmann
Fridericia truncata (Sprague) L. G. Lohmann
Fridericia tuberculata (DC.) L. G. Lohmann
Fridericia tynanthoides (A. H. Gentry) L. G. Lohmann
Fridericia viscida (Donn. Sm.) L. G. Lohmann
Fridericia whitei (Rusby) L. G. Lohmann
Gardnerodoxa Sandwith, = **Neojobertia** Baill.
Gardnerodoxa mirabilis Sandwith, = **Neojobertia mirabilis** (Sandwith) L. G. Lohmann
Glaziova Bureau, = **Amphilophium** Kunth
Glaziova bauhinioides Bureau ex Baill.**, = **Amphilophium bauhinioides** (Bureau ex Baill.) L. G. Lohmann
Hanburyophyton Bureau, = **Mansoa** DC.
Hanburyophyton xanthinum Bureau, = **Mansoa lanceolata** (DC.) A. H. Gentry
Haplolophium Cham., = **Amphilophium** Kunth
Haplolophium blanchetii DC., = **Amphilophium blanchetii** (DC.) Bureau & K. Schum.
Haplolophium bracteatum Cham., = **Amphilophium bracteatum** (Cham.) L. G. Lohmann
Haplolophium dusenianum Kraenzl., = **Amphilophium dusenianum** (Kraenzl.) L. G. Lohmann
Haplolophium glaziovii (Bureau ex K. Schum.) A. H. Gentry, = **Amphilophium dusenianum** (Kraenzl.) L. G. Lohmann

Haplolophium nunezii A. H. Gentry, = **Amphilophium nunezii** (A. H. Gentry) L. G. Lohmann
Haplolophium rodriguesii A. H. Gentry, = **Amphilophium rodriguesii** (A. H. Gentry) L. G. Lohmann
Heterocalycium Rauschert, = **Xylophragma** Sprague
Heterocalycium heterocalyx (Bureau & K. Schum.) Rauschert, = **Xylophragma heterocalyx** (Bureau & K. Schum.) A. H. Gentry
Hilariophyton Pichon, = **Tanaecium** Sw.
Hilariophyton brasiliensis (Baill.) Pichon, = **Tanaecium neobrasiliense** L. G. Lohmann
[*Jacaranda* Juss., Bignoniaeceae, Tribe Jacarandeae]
Jacaranda alba (Aubl.) Spreng., = **Adenocalymma album** (Aubl.) L. G. Lohmann
Jacaranda arvensis (Vell.) Steud., = **Anemopaegma arvense** (Vell.) Stellfeld ex J. F. Souza
Jacaranda orbiculata (Jacq.) Spreng., = **Anemopaegma orbiculatum** (Jacq.) DC.
Kuhlmannia J. C. Gomes, = **Pleonotoma** Miers
Kuhlmannia colatinensis J. C. Gomes, = **Pleonotoma albiflora** (Salzm. ex DC.) A. H. Gentry
Leucocalantha Barb. Rodr., = **Pachyptera** DC. ex Meisn.
Leucocalantha aromatica Barb. Rodr., = **Pachyptera aromatica** (Barb. Rodr.) L. G. Lohmann
Leucocolanthe, orth. var., = **Pachyptera** DC. ex Meisn.
Levya Bureau ex Baill., = **Bignonia** L.
Levya nicaraguensis Bureau ex Baill., = **Bignonia aequinoctialis** L.
Lundia DC.
Lundia chica (Bonpl.) Seem., = **Fridericia chica** (Bonpl.) L. G. Lohmann
Lundia cordata (Vell.) DC., = **Lundia corymbifera** (Vahl) Sandwith
Lundia corymbifera (Vahl) Sandwith
Lundia damazii, orth. var., = **Lundia damazioi** C. DC.
Lundia damazioi C. DC.
Lundia densiflora DC.**
Lundia erionema DC.
Lundia gardneri Sandwith
Lundia glabra DC., = **Lundia nitidula** DC.
Lundia heliocalyx A. H. Gentry
Lundia laevis Kaehler
Lundia longa (Vell.) DC.
Lundia neolonga L. G. Lohmann, = **Lundia damazioi** C. DC.
Lundia nitidula DC.
Lundia nitidula var. *virginalis* (DC.) Bureau, = **Lundia virginalis** DC.
Lundia obliqua Sond.**
Lundia puberula Pittier
Lundia spruceana Bureau
Lundia virginalis DC.**
Lundia virginalis var. *nitidula* (DC.) A. H. Gentry, = **Lundia nitidula** DC.
Macfadyena A. DC., = **Dolichandra** Cham.
Macfadyena bipinnata S. Moore, = **Adenocalymma bipinnatum** (S. Moore) L. G. Lohmann
Macfadyena bracteosa (DC.) Benth., = **Adenocalymma bracteosa** (DC.) L. G. Lohmann
Macfadyena corymbosa (Vent.) Griseb., = **Bignonia corymbosa** (Vent.) L. G. Lohmann
Macfadyena cynanchoides (Cham.) Morong, = **Dolichandra cynanchoides** Cham.
Macfadyena dentata K. Schum.**, = **Dolichandra dentata** (K. Schum.) L. G. Lohmann
Macfadyena fallax (Cham.) S. Moore, = **Adenocalymma pubescens** (Spreng.) L. G. Lohmann
Macfadyena japurensis (DC.) Miers, = **Fridericia japurensis** (DC.) L. G. Lohmann
Macfadyena obovata (Kunth) Miers, = **Martinella obovata** (Kunth) Bureau & K. Schum.
Macfadyena phellosperma Hemsl., = **Bignonia phellosperma** (Hemsl.) L. G. Lohmann
Macfadyena podopogon (DC.) Griseb., = **Fridericia podopogon** (DC.) L. G. Lohmann
Macfadyena uncata (Andrew) Sprague & Sandwith, = **Dolichandra uncata** (Andrews) L. G. Lohmann
Macfadyena uncinata (G. Mey.) A. DC., = **Dolichandra uncata** (Andrews) L. G. Lohmann
Macfadyena unguis-cati (L.) A. H. Gentry, = **Dolichandra unguis-cati** (L.) L. G. Lohmann
Macranthisiphon Bureau ex K. Schum., = **Bignonia** L.
Macranthisiphon longiflorus (Cav.) K. Schum., = **Bignonia longiflora** Cav.
Macrodiscus Bureau, = **Amphilophium** Kunth
Macrodiscus lactiflorus (Vahl) Bureau ex K. Schum., = **Amphilophium lactiflorum** (Vahl) L. G. Lohmann
Macrodiscus rigescens (Jacq.) Bureau, = **Amphilophium lactiflorum** (Vahl) L. G. Lohmann
Manaosella J. C. Gomes
Manaosella cordifolia (DC.) A. H. Gentry
Manaosella erythraea = **Pachyptera erythraea** (Dugand) A. H. Gentry
Manaosella platydactyla (Barb. Rodr.) J. C. Gomes, = **Manaosella cordifolia** (DC.) A. H. Gentry
Mansoa DC.
Mansoa alliacea (Lam.) A. H. Gentry
Mansoa angustidens (DC.) Bureau & K. Schum.
Mansoa difficilis (Cham.) Bureau & K. Schum.
Mansoa erythraea (Dugand) A. H. Gentry, = **Pachyptera erythraea** (Dugand) A. H. Gentry
Mansoa glaziovii Bureau & K. Schum.**
Mansoa hirsuta DC.
Mansoa hymenaea (DC.) A. H. Gentry
Mansoa kerere (Aubl.) A. H. Gentry, = **Pachyptera kerere** (Aubl.) Sandwith
Mansoa lanceolata (DC.) A. H. Gentry
Mansoa montecillensis (Ant. Molina) C. Nelson
Mansoa onohualcoides A. H. Gentry
Mansoa parvifolia (A. H. Gentry) A. H. Gentry
Mansoa standleyi (Steyerm.) A. H. Gentry
Mansoa truncata Sprague, = **Fridericia truncata** (Sprague) L. G. Lohmann
Mansoa ventricosa A. H. Gentry, = **Pachyptera ventricosa** (A. H. Gentry) L. G. Lohmann
Mansoa verrucifera (Schltdl.) A. H. Gentry
Martinella Baill.
Martinella iquitoensis A. Samp.
Martinella martinii (DC.) Baill. ex K. Schum., = **Martinella obovata** (Kunth) Bureau & K. Schum.
Martinella obovata (Kunth) Bureau & K. Schum.
Martinella verrucosa (Standl.) Standl., = **Fridericia schumanniana** (Loes.) L. G. Lohmann
Melloa Bureau, = **Dolichandra** Cham.
Melloa populifolia (DC.) Bureau, = **Dolichandra quadrivalvis** (Jacq.) L. G. Lohmann
Melloa quadrivalis (Jacq.) A. H. Gentry, = **Dolichandra quadrivalvis** (Jacq.) L. G. Lohmann
Memora Miers, = **Adenocalymma** Mart. ex Meisn.
Memora adenophora Sandwith, = **Adenocalymma adnophorum** (Sandwith) L. G. Lohmann
Memora alba (Aubl.) Miers, = **Adenocalymma album** (Aubl.) L. G. Lohmann

Memora albiflora (Salzm. ex DC.) Miers, = **Pleonotoma albiflora** (Salzm. ex DC.) A. H. Gentry
Memora allamandiflora Bureau ex K. Schum., = **Adenocalymma allamandiflorum** (Bureau ex K. Schum.) L. G. Lohmann
Memora aspericarpa A. H. Gentry, = **Adenocalymma aspericarpum** (A. H. Gentry) L. G. Lohmann
Memora axillaris K. Schum.**, = **Adenocalymma axillare** (K. Schum.) L. G. Lohmann
Memora bilabiata Sprague, = **Tanaecium bilabiatum** (Sprague) L. G. Lohmann
Memora bipinnata (S. Moore) A. H. Gentry, = **Adenocalymma bipinnatum** (S. Moore) L. G. Lohmann
Memora biternata A. Samp., = **Adenocalymma biternatum** (A. Samp.) L. G. Lohmann
Memora bracteosa (DC.) Bureau ex K. Schum., = **Adenocalymma bracteosum** (DC.) L. G. Lohmann
Memora campicola Pilg.**, = **Adenocalymma campicola** (Pilg.) L. G. Lohmann
Memora candolleana (Mart. ex DC.) Miers, = **Neojobertia candolleana** (Mart. ex DC.) Bureau & K. Schum.
Memora cidii A. H. Gentry ex Hauk, = **Adenocalymma cidii** (A. H. Gentry ex Hauk) L. G. Lohmann
Memora cladotricha Sandwith, = **Adenocalymma cladotricum** (Sandwith) L. G. Lohmann
Memora contracta A. H. Gentry ex Hauk, = **Adenocalymma contractum** (A. H. Gentry ex Hauk) L. G. Lohmann
Memora cristacalyx A. H. Gentry, = **Adenocalymma cristacalyx** (A. H. Gentry) L. G. Lohmann
Memora croatii A. H. Gentry, = **Adenocalymma croatii** (A. H. Gentry) L. G. Lohmann
Memora fallax (Cham.) Bureau, = **Adenocalymma pubescens** (Spreng.) L. G. Lohmann
Memora flavida (DC.) Bureau & K. Schum., = **Adenocalymma validum** (K. Schum.) L. G. Lohmann
Memora flaviflora (Miq.) Pulle, = **Adenocalymma flaviflorum** (Miq.) L. G. Lohmann
Memora fluminensis (Vell.) Miers, = **Pleonotoma fluminensis** (Vell.) A. H. Gentry
Memora heterophylla (Kraenzl.) Sandwith, = **Adenocalymma heterophyllum** Kraenzl.
Memora imperatoris-maximilianii (Wawra) A. H. Gentry, = **Adenocalymma imperatoris-maximilianii** (Wawra) L. G. Lohmann
Memora involucrata Bureau & K. Schum., = **Adenocalymma involucratum** (Bureau & K. Schum.) L. G. Lohmann
Memora juliae A. H. Gentry, = **Adenocalymma juliae** (A. H. Gentry) L. G. Lohmann
Memora longilinea A. Samp., = **Adenocalymma longilineum** (A. Samp.) L. G. Lohmann
Memora magnifica (Mart. ex DC.) Bureau, = **Adenocalymma magnificum** Mart. ex DC.
Memora mollis A. H. Gentry, = **Adenocalymma molle** (A. H. Gentry) L. G. Lohmann
Memora moringifolia (DC.) Sandwith, = **Adenocalymma moringifolium** (DC.) L. G. Lohmann
Memora nodosa (Silva Manso) Miers, = **Adenocalymma nodosum** (Silva Manso) L. G. Lohmann
Memora patula Miers, = **Adenocalymma patulum** (Miers) L. G. Lohmann
Memora paucifoliolata A. H. Gentry, = **Adenocalymma paucifoliolatum** (A. H. Gentry) L. G. Lohmann
Memora pedunculata (Vell.) Miers, = **Adenocalymma pedunculatum** (Vell.) L. G. Lohmann
Memora peregrina (Miers) Sandwith, = **Adenocalymma peregrinum** (Miers) L. G. Lohmann
Memora perianthomega (Bell.) Miers, = **Perianthomega vellozoi** Bureau
Memora pseudopatula A. H. Gentry, = **Adenocalymma peregrinum** (A. H. Gentry) L. G. Lohmann
Memora pubescens (Spreng.) K. Schum., = **Adenocalymma pubescens** (Spreng.) L. G. Lohmann
Memora racemosa A. H. Gentry, = **Adenocalymma racemosum** (A. H. Gentry) L. G. Lohmann
Memora sastrei A. H. Gentry, = **Adenocalymma sastrei** (A. H. Gentry ex Hauk) L. G. Lohmann
Memora schomburgkii (DC.) Miers, = **Adenocalymma schomburgkii** (DC.) L. G. Lohmann
Memora tanaeciicarpa A. H. Gentry, = **Adenocalymma tanaeciicarpum** (A. H. Gentry) L. G. Lohmann
Memora tetraquetra (Cham.) Miers, = **Pleonotoma tetraquetra** (Cham.) Bureau
Memora valida K. Schum., = **Adenocalymma validum** (K. Schum.) L. G. Lohmann
Memora velutina A. H. Gentry ex Hauk, = **Adenocalymma velutinum** (A. H. Gentry) L. G. Lohmann
Microbignonia Kraenzl., = **Dolichandra** Cham.
Microbignonia auristellae Kraenzl., = **Dolichandra unguiscati** (L.) L. G. Lohmann
Micropaegma Pichon, = **Bignonia** L.
Micropaegma brachycalyx (Bureau & K. Schum.) Pichon, = **Bignonia prieurii** DC.
Mussatia Bureau ex Baill., = **Bignonia** L.
Mussatia caudiculata (Standl.) Seibert, = **Tanaecium caudiculatum** (Standl.) L. G. Lohmann
Mussatia hyacinthina (Standl.) Sandwith, = **Bignonia hyancinthina** (Standl.) L. G. Lohmann
Mussatia prieurii (DC.) Bureau ex K. Schum., = **Bignonia prieurii** DC.
Neojobertia Baill.
Neojobertia brasiliensis Baill., = **Neojobertia candolleana** (Mart. ex DC.) Bureau & K. Schum.
Neojobertia candolleana (Mart. ex DC.) Bureau & K. Schum.
Neojobertia mirabilis (Sandwith) L. G. Lohmann
Neomacfadya Baill., = **Fridericia** Mart.
Neomacfadya podopogon (DC.) Baill. ex K. Schum., = **Fridericia podopogon** (DC.) L. G. Lohmann
Neomacfadyena, orth. var., = **Fridericia** Mart.
Nestoria Urb., = **Pleonotoma** Miers
Nestoria albiflora (Salzm. ex DC.) Sandwith, = **Pleonotoma albiflora** (Salzm. ex DC.) A. H. Gentry
Nestoria obtusifoliolata (Bureau & K. Schum.) Urb., = **Pleonotoma albiflora** (Salzm. ex DC.) A. H. Gentry
Neves-armondia K. Schum., = **Amphilophium** Kunth
Neves-armondia cordifolia (Mart.) K. Schum., = **Amphilophium falcatum** (Vell.) L. G. Lohmann
Nouletia Endl., = **Cuspidaria** DC.
Nouletia pterocarpa (Cham.) Pichon, = **Cuspidaria convoluta** (Vell.) A. H. Gentry
Odontotecoma Bureau & K. Schum., = **Adenocalymma** Mart. ex Meisn.
Odontotecoma fulgens Bureau & K. Schum., = **Adenocalymma cymbalum** (Cham.) Bureau & K. Schum.
Onohualcoa Lundell, = **Mansoa** DC.
Onohualcoa seleri (Loes.) Lundell, = **Mansoa verrucifera** (Schltdl.) A. H. Gentry
Onohualcoa verricifera (Schltdl.) A. H. Gentry, = **Mansoa verrucifera** (Schltdl.) A. H. Gentry
Orthotheca Pichon, = **Xylophragma** Sprague
Orthotheca heterocalyx (Bureau & K. Schum.) Pichon, = **Xylophragma heterocalyx** (Bureau & K. Schum.) A. H. Gentry
Osmhydrophora Barb. Rodr., = **Bignonia** L.

Osmhydrophora nocturna Barb. Rodr., = **Bignonia nocturna** (Barb. Rodr.) L. G. Lohmann
Osmohydrophora, orth. var., = **Bignonia** L.
Pachyptera DC. ex Meisn.
Pachyptera alliacea (Lam.) A. H. Gentry, = **Mansoa alliacea** (Lam.) A. H. Gentry
Pachyptera aromatica (Barb. Rodr.) L. G. Lohmann
Pachyptera erythraea (Dugand) A. H. Gentry
Pachyptera foveolata DC., = **Pachyptera kerere** (Aubl.) Sandwith
Pachyptera hymenaea (DC.) A. H. Gentry, = **Mansoa hymenaea** (DC.) A. H. Gentry
Pachyptera kerere (Aubl.) Sandwith
Pachyptera kerere var. *erythraea* Dugand, = **Pachyptera erythraea** (Dugand) A. H. Gentry
Pachyptera parvifolia A. H. Gentry, = **Mansoa parvifolia** (A. H. Gentry) A. H. Gentry
Pachyptera standleyi (Steyerm.) A. H. Gentry, = **Mansoa standleyi** (Steyerm.) A. H. Gentry
Pachyptera ventricosa (A. H. Gentry) L. G. Lohmann
Panterpa Miers, = **Fridericia** Mart.
Panterpa dichotoma (Jacq.) Miers, = **Fridericia dichotoma** (Jacq.) L. G. Lohmann
Panterpa leucopogon (Cham.) Miers, = **Fridericia leucopogon** (Cham.) L. G. Lohmann
Panterpa mollissima (Kunth) Miers, = **Fridericia mollissima** (Kunth) L. G. Lohmann
Panterpa prieurii (DC.) Miers, = **Bignonia prieurii** DC.
Panterpa puberula (Mart. ex DC.) Miers, = **Cuspidaria puberula** Mart. ex DC.
Parabignonia Bureau ex K. Schum., = **Dolichandra** Cham.
Parabignonia chodatii (Hassl.) A. H. Gentry, = **Dolichandra chodatii** (Hassl.) L. G. Lohmann
Parabignonia maximillianii (Mart. ex DC.) Bureau ex K. Schum., = **Dolichandra unguiculata** (Vell.) L. G. Lohmann
Parabignonia steyermarkii Sandwith, = **Dolichandra steyermarkii** (Sandwith) L. G. Lohmann
Parabignonia unguiculata (Vell.) A. H. Gentry, = **Dolichandra unguiculata** (Vell.) L. G. Lohmann
Paracarpaea Pichon, = **Cuspidaria** DC.
Paracarpaea pulchella (Cham.) Pichon, = **Cuspidaria pulchella** (Cham.) K. Schum.
Paradolichandra Hassl., = **Dolichandra** Cham.
Paradolichandra chodatii Hassl., = **Dolichandra chodatii** (Hassl.) L. G. Lohmann
Paragonia Bureau, = **Tanaecium** Sw.
Paragonia brasiliensis (Baill.) A. H. Gentry, = **Tanaecium neobrasiliense** L. G. Lohmann
Paragonia pyramidata (Rich.) Bureau, = **Tanaecium pyramidatum** (Rich.) L. G. Lohmann
Paragonia schumanniana Loes., = **Fridericia schumanniana** (Loes.) L. G. Lohmann
Paramansoa Baill., = **Fridericia** Mart.
Paramansoa grosourdyana Baill.**, = **Fridericia grosourdyana** (Baill.) L. G. Lohmann
[*Peltospermum* DC., = *Aspidosperma* Mart. & Zucc., Apocynaceae]
Peltospermum orbiculatum (Jacq.) DC. ex Meisn., = **Anemopaegma orbiculatum** (Jacq.) A. DC.
Pentelesia Raf., = **Fridericia** Mart.
Pentelesia discolor Raf., = **Fridericia carichanensis** (Kunth) L. G. Lohmann
Perianthomega Bureau ex Baill.
Perianthomega vellozoi Bureau
Periarrabidaea A. Samp.**, = **Tanaecium** Sw.
Periarrabidaea truncata A. Samp., = **Tanaecium truncatum** (A. Samp.) L. G. Lohmann
Petastoma Miers., = **Fridericia** Mart.
Petastoma caudiculata Standl., = **Tanaecium caudiculatum** (Standl.) L. G. Lohmann
Petastoma claussenii (A. DC.) Miers, = **Fridericia claussenii** (A. DC.) L. G. Lohmann
Petastoma corymbiferum (Vahl) Miers, = **Lundia corymbifera** (Vahl) Sandwith
Petastoma cuneifolium (DC.) Bureau & K. Schum., = **Fridericia cuneifolia** (DC.) L. G. Lohmann
Petastoma formosum Bureau**, = **Fridericia formosa** (Bureau) L. G. Lohmann
Petastoma kerere (Aubl.) Schnee, = **Pachyptera kerere** (Aubl.) Sandwith
Petastoma leucopogon (Cham.) Bureau ex Warm., = **Fridericia leucopogon** (Cham.) L. G. Lohmann
Petastoma paradoxum Sandwith, = **Fridericia paradoxa** (Sandwith) L. G. Lohmann
Petastoma patelliferum (Schltdl.) Miers, = **Fridericia patellifera** (Schltdl.) L. G. Lohmann
Petastoma platyphyllum (DC.) Miers, = **Xylophragma platyphyllum** (DC.) L. G. Lohmann
Petastoma poeppigii (DC.) Sandwith, = **Fridericia poeppigii** (DC.) L. G. Lohmann
Petastoma pubescens (L.) Miers, = **Fridericia pubescens** (L.) L. G. Lohmann
Petastoma samydoides (Cham.) Sandwith, = **Fridericia samydoides** (Cham.) L. G. Lohmann
Petastoma sceptrum (Cham.) Miers, = **Cuspidaria sceptrum** (Cham.) L. G. Lohmann
Petastoma trachyphylla Bureau & K. Schum., = **Fridericia trachyphylla** (Bureau & K. Schum.) L. G. Lohmann
Petastoma triplinervia (Mart. ex DC.) Miers, = **Fridericia triplinervia** (Mart. ex DC.) L. G. Lohmann
Petastoma truncatum (Sprague) Hassl., = **Fridericia truncata** (Sprague) L. G. Lohmann
Petastoma whitei (Rusby) Sandwith, = **Fridericia whitei** (Rusby) L. G. Lohmann
Phaedranthus Miers, = **Amphilophium** Kunth
Phaedranthus buccinatorius (DC.) Miers, = **Amphilophium buccinatorium** (DC.) L. G. Lohmann
Phaedranthus lindleyanus Miers, = **Amphilophium buccinatorium** (DC.) L. G. Lohmann
Pharseophora Miers, = **Adenocalymma** Mart. ex Meisn.
Pharseophora bracteosa (DC.) Miers, = **Adenocalymma bracteosum** (DC.) L. G. Lohmann
Pharseophora fallax (Cham.) Miers, = **Adenocalymma pubescens** (Spreng.) L. G. Lohmann
Phryganocydia Mart. ex Bureau, = **Bignonia** L.
Phryganocydia corymbosa (Vent.) Bureau ex K. Schum., = **Bignonia corymbosa** (Vent.) L. G. Lohmann
Phryganocydia phellosperma (Hemsl.) Sandwith, = **Bignonia phellosperma** (Hemsl.) L. G. Lohmann
Phryganocydia uliginosa Dugand, = **Bignonia neouliginosa** L. G. Lohmann
Phrygiobureaua Kuntze, = **Bignonia** L.
Phrygiobureaua corymbosa (Vent.) Kuntze, = **Bignonia corymbosa** (Vent.) L. G. Lohmann
Piriadicus Pichon, = **Fridericia** Mart.
Piriadacus erubescens (DC.) Pichon, = **Fridericia erubescens** (DC.) L. G. Lohmann
Pithecoctenium Mart. ex DC., = **Amphilophium** Kunth
Pithecoctenium buccinatorium DC., = **Amphilophium buccinatorium** (DC.) L. G. Lohmann
Pithecoctenium buccinatorium var. *subinclusum* DC., = **Amphilophium buccinatorium** (DC.) L. G. Lohmann

Pithecoctenium callistegioides (Cham.) Niederl., = **Bignonia callistegioides** Cham.
Pithecoctenium carolinae (Lindl.) G. Nicholson, = **Amphilophium carolinae** (Lindl.) L. G. Lohmann
Pithecoctenium crucigerum (L.) A. H. Gentry, = **Amphilophium crucigerum** (L.) L. G. Lohmann
Pithecoctenium cuneifolium DC., = **Amphilophium cuneifolium** (DC.) L. G. Lohmann
Pithecoctenium cynanchoides DC., = **Amphilophium carolinae** (Lindl.) L. G. Lohmann
Pithecoctenium dolichoides (Cham.) Bureau ex K. Schum., = **Amphilophium dolichoides** (Cham.) L. G. Lohmann
Pithecoctenium echinatum (Jacq.) Baill., = **Amphilophium crucigerum** (L.) L. G. Lohmann
Pithecoctenium elongatum (Vahl) Klotzch, = **Amphilophium elongatum** (Vahl) L. G. Lohmann
Pithecoctenium falcatum (Vell.) A. Pool, = **Amphilophium falcatum** (Vell.) L. G. Lohmann
Pithecoctenium frutescens DC., = **Amphilophium frutescens** (DC.) L. G. Lohmann
Pithecoctenium glaziovii Bureau ex K. Schum., = **Amphilophium dusenianum** (Kraenzl.) L. G. Lohmann
Pithecoctenium granulosum Klotzsch, = **Amphilophium granulosum** (Bureau & K. Schum.) L. G. Lohmann
Pithecoctenium granulosum (Bureau & K. Schum.) Sprague & Sandwith, = **Amphilophium granulosum** (Bureau & K. Schum.) L. G. Lohmann
Pithecoctenium laxiflorum DC., = **Amphilophium laxiflorum** (DC.) L. G. Lohmann
Pithecoctenium parviflorum Mart. ex DC.**, = **Fridericia parviflora** (Mart. ex DC.) L. G. Lohmann
Pithecoctenium scabriusculum Mart. ex DC., = **Amphilophium scabriusculum** (Mart. ex DC.) L. G. Lohmann
Pithecoctenium sciuripabulum (K. Schum.) Corr. Méllo, = **Bignonia sciuripabulum** (K. Schum.) L. G. Lohmann
Pithecoctenium stipulare Mart. ex DC., = **Amphilophium frutescens** (DC.) L. G. Lohmann
Platolaria Raf., = **Anemopaegma** Mart. ex Meisn.
Platolaria flavescens Raf., = **Anemopaegma orbiculatum** (Jacq.) A. Gentry
Pleonotoma Miers
Pleonotoma albiflora (Salzm. ex DC.) A. H. Gentry
Pleonotoma bracteata A. H. Gentry
Pleonotoma castelnaei (Bureau) Sandwith
Pleonotoma clematis (Kunth) Miers
Pleonotoma dendrotricha Sandwith
Pleonotoma diversifolium (Kunth) Bureau & K. Schum., = **Bignonia diversifolia** Kunth
Pleonotoma echitidea Sprague & Sandwith
Pleonotoma exserta A. H. Gentry
Pleonotoma fissicalyx B. M. Gomes & Proença
Pleonotoma flavida (DC.) Miers, = **Adenocalymma validum** (K. Schum.) L. G. Lohmann
Pleonotoma fluminensis (Vell.) A. H. Gentry
Pleonotoma imperatoris-maximilianii (Wawra) Bureau & K. Schum., = **Adenocalymma imperatoris-maximilianii** (Wawra) L. G. Lohmann
Pleonotoma inaequalis (DC. ex Splitg.) Miers, = **Cuspidaria inaequalis** (DC. ex Splitg.) L. G. Lohmann
Pleonotoma jasminifolia (Kunth) Miers
Pleonotoma lanceolata (DC.) Miers, = **Mansoa lanceolata** (DC.) A. H. Gentry
Pleonotoma longiflora B. M. Gomes & Proença
Pleonotoma melioides (S. Moore) A. H. Gentry
Pleonotoma moringifolia (DC.) Miers, = **Adenocalymma moringifolium** (DC.) L. G. Lohmann
Pleonotoma orientalis Sandwith
Pleonotoma pavettiflora Sandwith
Pleonotoma peregrina Miers, = **Adenocalymma peregrinum** (Miers) L. G. Lohmann
Pleonotoma stichadenia K. Schum.**
Pleonotoma tetraquetra (Cham.) Bureau
Pleonotoma variabilis (Jacq.) Miers
Pleonotoma variabilis var. *castelnaei* Bureau, = **Pleonotoma castelnaei** (Bureau) Sandwith
Potamoganos Sandwith, = **Bignonia** L.
Potamoganos microcalyx (G. Mey.) Sandwith, = **Bignonia microcalyx** G. Mey.
Pseudocalymma A. Samp. & Kuhlm., = **Mansoa** DC.
Pseudocalymma alliaceum (Lam.) Sandwith, = **Mansoa alliacea** (Lam.) A. H. Gentry
Pseudocalymma elegans (Vell.) Kuhlm., = **Fridericia elegans** (Vell.) L. G. Lohmann
Pseudocalymma hymenaeum (DC.) Sandwith, = **Mansoa hymenaea** (DC.) A. H. Gentry
Pseudocalymma laevigatum (Bureau & K. Schum.) A. Samp. & Kuhlm., = **Mansoa hymenaea** (DC.) A. H. Gentry
Pseudocalymma standleyi Steyerm., = **Mansoa standleyi** (Steyerm.) A. H. Gentry
Pseudocalymna, orth. var., = **Mansoa** DC.
Pseudocatalpa A. H. Gentry, = **Tanaecium** Sw.
Pseudocatalpa caudiculata (Standl.) A. H. Gentry, = **Tanaecium caudiculatum** (Standl.) L. G. Lohmann
Pseudopaegma Urb., = **Anemopaegma** Mart. ex Meisn.
Pseudopaegma colombianum Sandwith**, = **Anemopaegma colombianum** (Sandwith) A. H. Gentry
Pseudopaegma insculptum Sandwith, = **Anemopaegma insculptum** (Sandwith) A. H. Gentry
Pseudopaegma jucundum (Bureau & K. Schu.) Urb., = **Anemopaegma jucundum** Bureau & K. Schum.
Pseudopaegma longidens (Mart. ex DC.) Urb., = **Anemopaegma longidens** Mart. ex DC.
Pseudopaegma mirabile Sandwith, = **Anemopaegma mirabile** (Sandwith) A. H. Gentry
Pseudopaegma oligoneuron Sprague & Sandwith, = **Anemopaegma oligoneuron** (Sprague & Sandwith) A. H. Gentry
Pyrostegia C. Presl
Pyrostegia cinerea Bureau ex K. Schum., = **Cuspidaria cinerea** (Bureau ex K. Schum.) L. G. Lohmann
Pyrostegia dichotoma Miers ex K. Schum., = **Pyrostegia venusta** (Ker Gawl.) Miers
Pyrostegia ignea (Vell.) C. Presl, = **Pyrostegia venusta** (Ker Gawl.) Miers
Pyrostegia lauta Miers, = **Fridericia lauta** (Bureau & K. Schum.) L. G. Lohmann
Pyrostegia longiflora (Cav.) Miers, = **Bignonia longiflora** Cav.
Pyrostegia millingtonioides Sandwith
Pyrostegia venusta (Ker Gawl.) Miers
Roentgenia Urb., = **Bignonia** L.
Roentgenia bracteomana (K. Schum.) Urb., = **Bignonia bracteomana** (K. Schum.) L. G. Lohmann
Roentgoenia sordida (Bureau & K. Schum.) Sprague & Sandwith, = **Bignonia sordida** (Bureau & K. Schum.) L. G. Lohmann
Rojasiophyton Hassl., = **Xylophragma** Sprague
Rojasiophyton tuberculatum Hassl., = **Xylophragma pratense** (Bureau & K. Schum.) Sprague
Saldanhaea Bureau, = **Cuspidaria** DC.
Saldanhaea argentea (Wawra) J. C. Gomes, = **Cuspidaria argentea** (Wawra) Sandwith
Saldanhaea bracteata Bureau & K. Schum., = **Cuspidaria cratensis** (J. C. Gomes) A. H. Gentry ex L. G. Lohmann

Saldanhaea costaricensis Kraenzl.**, = **Fridericia costaricensis** (Kraenzl.) L. G. Lohmann
Saldanhaea cratensis J. C. Gomes, = **Cuspidaria cratensis** (J. C. Gomes) A. H. Gentry ex L. G. Lohmann
Saldanhaea floribunda (DC.) Sandwith, = **Cuspidaria floribunda** (DC.) A. H. Gentry
Saldanhaea heterocalyx Bureau & K. Schum.**, = **Xylophragma heterocalyx** (Bureau & K. Schum.) A. H. Gentry
Saldanhaea lateriflora (Mart.) Bureau, = **Cuspidaria lateriflora** (Mart.) DC.
Saldanhaea myriantha (Cham.) Bureau, = **Xylophragma myrianthum** (Cham.) Sprague
Saldanhaea pratensis Bureau & K. Schum.**, = **Xylophragma pratense** (Bureau & K. Schum.) Sprague
Saldanhaea puberula (Mart. ex DC.) J. C. Gomes, = **Cuspidaria puberula** Mart. ex DC.
Saldanhaea seemanniana Kuntze, = **Xylophragma seemannianum** (Kuntze) Sprague
Saldanhaea weberbaueri (Sprague) Sandwith, = **Cuspidaria weberbaueri** (Sprague) A. H. Gentry
Sampaiella J. C. Gomes, = **Adenocalymma** Mart. ex Meisn.
Sampaiella trichoclada (DC.) J. C. Gomes, = **Adenocalymma trichocladum** (DC.) L. G. Lohmann
Sanhilaria Baill., = **Tanaecium** Sw.
Sanhilaria brasiliensis Baill., = **Tanaecium neobrasiliense** L. G. Lohmann
Saritaea Dugand, = **Bignonia** L.
Saritaea magnifica (W. Bull) Dugand, = **Bignonia magnifica** W. Bull
Saritaea triplinvervia (Mart. ex DC.) Dugand, = **Fridericia triplinervia** (Mart. ex DC.) L. G. Lohmann
Schizopsis Bureau, = **Tynanthus** Miers
Schizopsis gondotiana, orth. var., = **Tynanthus goudotianus** (Bureau) Miers
Schizopsis goudotiana Bureau, = **Tynanthus goudotianus** (Bureau) Miers
Schizopsis labiata (Cham.) Bureau ex Baill., = **Tynanthus labiatus** (Cham.) Miers
Schizopsis panurensis Bureau, = **Tynanthus panurensis** (Bureau) Sandwith
Schizopsis polyantha Bureau**, = **Tynanthus polyanthus** (Bureau) Sandwith
Scobinaria Siebert, = **Fridericia** Mart.
Scobinaria japurensis (DC.) Sandwith, = **Fridericia japurensis** (DC.) L. G. Lohmann
Scobinaria verrucosa (Standl.) Seibert, = **Fridericia schumanniana** (Loes.) L. G. Lohmann
Sererera Raf., = **Pachyptera** DC. ex Meisn.
Sererera heterophylla Raf., = **Pachyptera kerere** (Aubl.) Sandwith
Setilobus Baill., = **Cuspidaria** DC.
Setilobus bracteatus Baill. ex Bureau & K. Schum.**, = **Cuspidaria bracteata** (Bureau & K. Schum.) L. G. Lohmann
Sideropogon Pichon, = **Cuspidaria** DC.
Sideropogon lasianthum (Bureau & K. Schum.) Pichon, = **Cuspidaria lasiantha** (Bureau & K. Schum.) L. G. Lohmann
Spathicalyx J. C. Gomes, = **Tanaecium** Sw.
Spathicalyx duckei (A. Samp.) A. H. Gentry, = **Tanaecium duckei** A. Samp.
Spathicalyx kuhlmannii J. C. Gomes, = **Tanaecium duckei** A. Samp.
Spathicalyx xanthophyllum (DC.) A. H. Gentry, = **Tanaecium xanthophyllum** (DC.) L. G. Lohmann
[*Spathodea* P. Beauv., Bignoniaceae, Tribe Oroxyleae]
Spathodea bracteosa DC., = **Adenocalymma bracteosum** (DC.) L. G. Lohmann
Spathodea candolleana Mart. ex DC., = **Neojobertia candolleana** (Mart. ex DC.) Bureau & K. Schum.
Spathodea corymbosa Vent., = **Bignonia corymbosa** (Vent.) L. G. Lohmann
Spathodea flaviflora Miq., = **Adenocalymma flaviflorum** (Miq.) L. G. Lohmann
Spathodea obovata Kunth, = **Martinella obovata** (Kunth) Bureau & K. Schum.
Spathodea podopogon DC., = **Fridericia podopogon** (DC.) L. G. Lohmann
Spathodea schomburgkii DC., = **Adenocalymma schomburgkii** (DC.) L. G. Lohmann
Spathodea uncata (Andrews) Spreng., = **Dolichandra uncata** (Andrews) L. G. Lohmann
Stenosiphanthus A. Samp., = **Fridericia** Mart.
Stenosiphanthus duckei A. Samp, = **Fridericia lauta** (Bureau & K. Schum.) L. G. Lohmann
Stizophyllum Miers
Stizophyllum cordifolium (DC.) Miers, = **Manaosella cordifolia** (DC.) A. H. Gentry
Stizophyllum inaequilaterum Bureau & K. Schum.
Stizophyllum perforatum (Cham.) Miers
Stizophyllum riparium (Kunth) Sandwith
[*Tabebuia* Gomes ex DC., Bignoniaceae, Tribe Crescentieae]
Tabebuia lanceolata DC., = **Mansoa lanceolata** (DC.) A. H. Gentry
Tabebuia japurensis DC., = **Fridericia japurensis** (DC.) L. G. Lohmann
Tabebuia latifolia (Rich.) DC., = **Callichlamys latifolia** (Rich.) K. Schum.
Tabebuia pyramidata (Rich.) DC., = **Tanaecium pyramidatum** (Rich.) L. G. Lohmann
Tabebuia xanthophylla DC., = **Tanaecium xanthophyllum** (DC.) L. G. Lohmann
Tanaecium Sw.
Tanaecium affine (A. H. Gentry) L. G. Lohmann
Tanaecium apiculatum A. H. Gentry
Tanaecium bilabiatum (Sprague) L. G. Lohmann
Tanaecium caudiculatum (Standl.) L. G. Lohmann
Tanaecium crucigerum Seem.
Tanaecium cyrtanthum (Mart. ex DC.) Bureau & K. Schum.
Tanaecium duckei A. Samp.
Tanaecium exitiosum Dugand
Tanaecium jaroba Sw.
Tanaecium mutabile (Bureau & K. Schum.) L. G. Lohmann
Tanaecium neobrasiliense L. G. Lohmann
Tanaecium nocturnum (Barb. Rodr.) Bureau & K. Schum., = **Bignonia nocturna** (Barb. Rodr.) L. G. Lohmann
Tanaecium pyramidatum (Rich.) L. G. Lohmann
Tanaecium revillae (A. H. Gentry) L. G. Lohmann
Tanaecium selloi (Spreng.) L. G. Lohmann
Tanaecium tetragonolobum (Jacq.) L. G. Lohmann
Tanaecium truncatum (A. Samp.) L. G. Lohmann
Tanaecium xanthophyllum (DC.) L. G. Lohmann
[*Tecoma* Juss., Bignoniaceae, Tribe Tecomeae]
Tecoma cyrtantha Mart. ex DC., = **Tanaecium cyrtanthum** (Mart. ex DC.) Bureau & K. Schum.
Tecoma hirta Mart. ex DC., = **Adenocalymma hirtum** (Mart. ex DC.) Bureau & K. Schum.
Tecoma lateriflora Mart.**, = **Cuspidaria lateriflora** (Mart.) DC.
Tecoma pratensis Bureau & K. Schum., = **Xylophragma pratense** (Bureau & K. Schum.) Sprague
Tecoma venusta (Ker Gawl.) Lem., = **Pyrostegia venusta** (Ker Gawl.) Miers

Tetrastichella Pichon, = **Cuspidaria** DC.
Tetrastichella inaequalis (DC. ex Splitg.) Pichon, = **Cuspidaria inaequalis** (DC. ex Splitg.) L. G. Lohmann
Tynanthus Miers
Tynanthus cognatus (Cham.) Miers
Tynanthus croatianus A. H. Gentry
Tynanthus elegans Miers
Tynanthus fasciculatus (Vell.) Miers
Tynanthus gondotiana, orth. var., = **Tynanthus goudotianus** (Bureau) Miers
Tynanthus goudotianus (Bureau) Bureau
Tynanthus guatemalensis Donn. Sm.
Tynanthus igneus Barb. Rodr., = **Pyrostegia venusta** (Ker Gawl.) Miers
Tynanthus hyacinthinus Standl., = **Bignonia hyancinthina** (Standl.) L. G. Lohmann
Tynanthus labiatus (Cham.) Miers
Tynanthus macranthus L. O. Williams
Tynanthus micranthus Corr. Méllo ex K. Schum.**
Tynanthus panurensis (Bureau) Sandwith
Tynanthus polyanthus (Bureau) Sandwith
Tynanthus pubescens A. H. Gentry
Tynanthus sastrei A. H. Gentry
Tynanthus schumannianus (Kuntze) A. H. Gentry
Tynanthus villosus A. H. Gentry
Tynnanthus, orth. var., = **Tynanthus** Miers
Urbaniella duseniana, orth. var., = **Amphilophium dusenianum** (Kraenzl.) L. G. Lohmann
Urbanolophium Melch., = **Amphilophium** Kunth
Urbanolophium dusenianum (Kraenzl.) Melch., = **Amphilophium dusenianum** (Kraenzl.) L. G. Lohmann
Urbanolophium glaziovii (Bureau ex K. Schum.) Melch., = **Amphilophium dusenianum** (Kraenzl.) L. G. Lohmann
Vasconcellia Mart., = **Fridericia** Mart.
Vasconcellia rego (Vell.) Mart., = **Fridericia rego** (Vell.) L. G. Lohmann
Vasconcellia sego (Vell.) Mart., = **Fridericia rego** (Vell.) L. G. Lohmann
[*Vitex* L., Lamiaceae]
Vitex bahiensis Schauer ex DC., = **Fridericia bahiensis** (Schauer ex DC.) L. G. Lohmann
Wunschmannia Urb., = **Amphilophium** Kunth
Wunschmannia staminea (Lam.) Urb., = **Amphilophium stamineum** (Lam.) L. G. Lohmann
Xylophragma Sprague
Xylophragma harleyi (A. H. Gentry ex M. M. Silva & L. P. Queiroz) L. G. Lohmann
Xylophragma heterocalyx (Bureau & K. Schum.) A. H. Gentry
Xylophragma myrianthum (Cham.) Sprague
Xylophragma platyphyllum (DC.) L. G. Lohmann
Xylophragma pratense (Bureau & K. Schum.) Sprague
Xylophragma seemannianum (Kuntze) Sandwith
Xylophragma xanthophylla (DC.) J. F. Macbr., = **Tanaecium xanthophyllum** (DC.) L. G. Lohmann
Xylophragma unifoliolatum J. F. Morales & Q. Jiménez